Children's Learning Through Play

CHILDREN'S LEARNING THROUGH PLAY

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Forward

We are pleased to share the first Canadian edition of Children's Learning Through Play. This textbook is being published as an open educational resource for students who are studying early childhood development. Content for this textbook was adapted and remixed using a variety of resources. The list can be found in the attribution section of this textbook.

The Canadian context has been added to align with the College of ECEs Code of Ethics and Standards of Practice as well as the Ministry of Education the Child and Early Years Act and finally speaks to the Calls to Action published by the Truth and Reconciliation Commission.

Loyalist College Land Affirmation

Loyalist College is built upon the lands governed by the Dish with One Spoon wampum agreement . We affirm and thank the Haudenosaunee, Anishinaabeg, Huron-Wendat, and Mississauga nations for their continued caretaking of the land. We offer respect to Indigenous people from all nations who call this area home. We honour traditional knowledge keepers, past, present, and future.

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2. Introduction to Curriculum for Early Childhood Education, Paris and Beeve (LibreText) https://socialsci.libretexts.org/Bookshelves/Early_Childhood_Education/ Book%3A_Introduction_to_Curriculum_for_Early_Childhood_Education_(Paris_Beeve_and_Springer)

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6. Arts Integration in Elementary Curriculum (2nd edition), Zhou and Brown (LibreText) https://socialsci.libretexts.org/Bookshelves/Early_Childhood_Education/Arts_Integratio n_in_Elementary_Curriculum%3A_2nd_Edition_(Zhou_and_Brown)

7. Instructional Methods Strategies and Technologies to Meet the Needs of All Learners, Lombardi (LibreText) https://socialsci.libretexts.org/Bookshelves/Early_Childhood_Education/ Instructional_Methods_Strategies_and_Technologies_(Lombardi_2018)/01%3A_Key_Practices_in_Ins truction_and_Student_Learning/1.10%3A_Storytelling_songs_role_play_and_drama

8. ECE Outdoor Play Resource Guide https://pressbooks.nscc.ca/eceoutdoorplay/chapter/importance-of-risk/

9. Preschool Methods https://pressbooks.nscc.ca/preschoolers/front-matter/about-the-book/

10. Mathematics Methods for Early Childhood https://fhsu.pressbooks.pub/ecumath/front- matter/ introduction/

References included in this textbook follow APA formatting whenever possible.

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Understanding Play

"Through play and inquiry, young children practice ways of learning and interacting with the world around them that they will apply throughout their lives. Problem-solving and critical thinking, communication and collaboration, creativity and imagination, initiative and citizenship are all capacities vital for success throughout school and beyond." (How Does Learning Happen? p.15*)*

Children are born observers and are active participants in their own learning and understanding of the world around them from the very beginning of their existence. Today's children are active participants in their own learning, not just recipients of a teacher's knowledge.

Figure 1: Play (Photo by Robert Collins on Unsplash)

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Indigenous Perspectives

People of the Haudenosaunee Confederacy are committed to lifelong learning. Adults understand they have a responsibility to their children to facilitate an environment where reciprocal learning occurs. Children and Elders learn from each other, and each are respected for their contributions and gifts

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1.1 Why Play?

"As children learn through play and inquiry, they develop – and have the opportunity to practice every day –

many of the skills and competencies that they will need in order to thrive in the future, including the ability to engage in innovative and complex problem-solving and critical and creative thinking; to work collaboratively with others; and to take what is learned and apply it in new situations in a constantly changing world." (The Kindergarten Program, 2016, p.11)

In its "Statement on Play-Based Learning," CMEC (Council of Ministers of Education, Canada). (2012), recognizes the educational value of play as follows:

The benefits of play are recognized by the scientific community. There is now evidence that neural pathways in children's brains are influenced by and advanced in their development through the exploration, thinking skills, problem-solving, and language expression that occur during play.

Research also demonstrates that play-based learning leads to greater social, emotional, and academic success. Based on such evidence, ministers of education endorse a sustainable pedagogy for the future that does not separate play from learning but brings them together to promote creativity in future generations. In fact, play is considered so essential to healthy development that the United Nations has recognized it as a specific right for all children.

Given the evidence, the CMEC believes in the intrinsic value and importance of play and its relationship to learning. Educators should intentionally plan and create challenging, dynamic, play-based learning opportunities. Intentional teaching is the opposite of teaching by rote or continuing with traditions simply because things have always been done that way. Intentional teaching involves educators' being deliberate and purposeful in creating play-based learning environments – because when children are playing, children are learning.

Play:

- Inspires imagination
- Facilitates creativity
- Fosters problem solving
- Promotes the development of new skills
- Build confidence and higher levels of self-esteem
- Allows free exploration of the environment
- Fosters learning through hands-on and sensory exploration

It is now understood that moments often discounted as "just play" or as "fooling around" are moments in which children are actively learning (Hirsh-Pasek et al. 2009; Jones and Reynolds 2011; Zigler, Singer, and Bishop-Josef 2004; Elkind 2007.) While engaged in play, children explore the physical properties of materials and the possibilities for action, transformation, or representation. Children try out a variety of ways to act on objects and materials and, in so doing, experiment with and build concepts and ideas. This active engagement with the world of people and objects starts from the moment of birth.

This description of the young child as an active participant in learning informs the role of the teacher who works with young children from birth to five. Early childhood teaching and learning begins with teachers watching and listening to discover how infants and young children actively engage in making sense of their everyday encounters with people and objects. When teachers observe and listen with care, infants and young children reveal clues about their thinking, their feelings, or their intentions. Children's actions, gestures, and words illuminate what they are trying to figure out and how they attempt to make sense of the attributes, actions, and responses of people and objects. Effective early childhood teaching requires teachers to recognize how infants and young children actively search for meaning, making sense of ideas and feelings.

When teaching is viewed in this light, children become active participants alongside teachers in negotiating the course of the curriculum. Families who entrust their children to the care and guidance of early childhood teachers also become active participants in this process. Shared participation by everyone in the work of creating lively

encounters with learning allows a dynamic exchange of information and ideas—from child to adult, from adult to child, from adult to adult, and from child to child. The perspective of each (child, family, teacher) informs the other, and each learns from the other. Each relationship (child with family, child with teacher, child with child, and family with teacher) is reciprocal, with each participant giving and receiving from the other, and each adding to the other's learning and understanding. (California Department of Education, p.5)
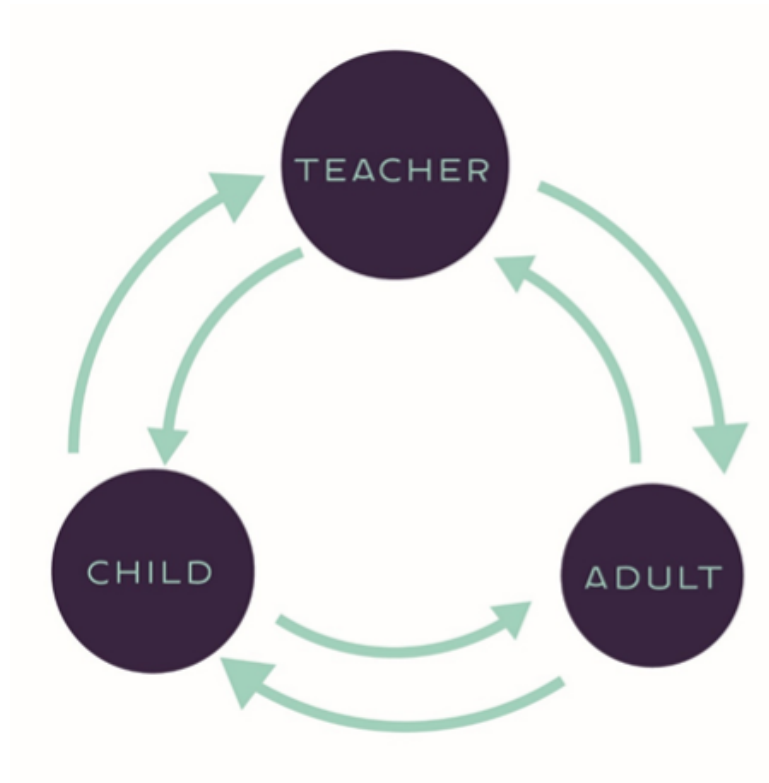

Figure 2: Each perspective informs the other (image by Ian Joslin)

Indigenous Perspective

Figure 3 The Haudenosaunee Corn Husk Doll (Wikipedia)

The Cornhusk doll is still used today by Haudenosaunee children. The teaching that accompanies the corn husk doll provides an opportunity for adults to interact in a meaningful way with children. The children practice essential relationship skills by providing holistic care for their doll using a combination of creative and dramatic play that reflects their understanding of family roles and responsibilities.

For more information on the teachings related to Corn Husk Dolls, see the link at the end of this chapter.

In Ontario, **The Kindergarten Program** (2016) sets out five fundamental principles of play-based learning:

1. Play is recognized as a child's right, and it is essential to the child's optimal development.
2. All children are viewed as competent, curious, capable of complex thinking, and rich in potential and experience.
3. A natural curiosity and a desire to explore, play, and enquire are the primary drivers of learning among young children.
4. The learning environment plays a key role in what and how a child learns.
5. In play-based learning programs, assessment supports the child's learning and autonomy as a learner

Recent brain research has heralded the benefits of a stimulating play-based environment in encouraging the brain to grow and develop (Diamond 1988). Low-stress levels and high engagement combine to nourish neural development. Research by Vandell and others (2005) demonstrates how school-aged care environments achieve this through the combination of high intrinsic motivation and challenge, effort, and enjoyment. Lester and Russell (2010) identified the flexibility and plasticity of the brain, which develops through play and increases the potential for learning later in life.

The intellectual and cognitive benefits of playing have been well documented. Children who engage in quality play experiences are more likely to:

- Have well-developed memory skills and language development,
- Can regulate their behaviour, leading to enhanced adjustment to school and academic learning.

Play also provides children with an opportunity to just be. Educators observe stages of play experiences children navigate in their programs. Educators use these observations of children to plan for environments, set individual objectives, and create appropriate curricular experiences.

Figure 4 Free to just be (Photo from Wallpaper Flare)

Pause to Reflect

What does it mean to just be? Consider a time either as a child or an adult, where you had an opportunity to just be.

What facilitated the opportunity?

What feelings did you experience?

What might this mean for young children?

1.2 History of Play

"Play lies at the core of creativity and innovation. Of all animal species, humans are the biggest players of all. We are built to play and built through play. When we play, we are engaged in the purest expression of our humanity, the truest expression of our individuality" (Brown, 2010).

The importance of and value placed on childhood play can be traced all the back to ancient civilizations (500 BC to 500 CE). Ancient Egyptians understood that play influenced later development. However, during the Middle Ages (900-1200), ensuring children simply survived became much more important than providing developmental opportunities. Children were treated like adults as they were needed in the labour force. The Renaissance Period (1200-1700) ushered in a renewed belief that childhood was distinct from adulthood and that play had value. Learning through play continued to be valued into the Modern Period (1700-1900), even though child labour continued to be common during the Industrial Revolution (1750-1840). During the late 20th century (1950-1999), "Research found that children develop in predictable stages, that the environment and genetic inheritance are

both instrumental, and that children construct. knowledge and intellect by doing" (Shipley, 2012, p.21). 21st century researchers continue to build on this foundational research, expanding our understanding of play theory and early learning.

Figure 5 child labour during the industrial revolution (Library of Congress, flickr)

1.3 Theories of Play

Barnard Gilmore (1966) proposed there are two categories of play theory: **classical theories** and **dynamic theories**. Classical theories (17th century to late 19th century) attempted to explain **why** people play while dynamic theories (20th century onward) attempt to explain **how** people play. Dynamic theories can be further categorized into **psychoanalytic theories** and **developmental theories.**

Classical Theories

- Surplus energy theory: energy not needed for work can be spent in play.
- Relaxation theory: play generates energy for work.
- Pre-exercise theory: play as practice for future roles in society.
- Recapitulation theory: children's play looks like the behaviour of people from an earlier time. (Shipley, 2012, p.22)

Dynamic Theories

Psychoanalytic Theories

Freud (1856-1939): Freud believed that play gives children a way to express inner feelings they are unable to verbalize.

Erikson (1902-1994): Erikson believed that play develops physical and emotional skills that contribute to the development of healthy self-esteem.

Developmental Theories

Piaget (1896-1980): Piaget believed that play is a tool for consolidating new information and behaviours.

Table 1.1 Piaget's Stages of Play

Stage	Description
Functional Play (birth to 18 months)	Exploring, inspecting, and learning through repetitive physical activity
Symbolic Play (2-4 years)	The ability to use objects, actions, or ideas to represent other objects, actions, or ideas and may include taking on roles.
Constructive Play (4-7 years)	Involves experimenting with objects to build things; learning things that were previously unknown with hands on manipulations of materials.
Games with Rules (6-11 years)	Imposes rules that must be followed by everyone that is playing; the logic and order involved forms that the foundations for developing game playing strategy.

Vygotsky (1896-1934): Vygotsky shared many of Piaget's principles about the value of play; however, he placed more emphasis on the importance of the social interactions between children and more experienced adults that can result in learning through play and guided discovery.

Postmodern Views (1980-current)

Many postmodern theorists (e.g.: Kohlberg, Gardner, Malaguzzi, Mustard) questioned earlier theories that children's play is universal and independent of cultural influences. They believe that "There are really two approaches to raising and educating children: a middle class, Eurocentric American approach, and a minority approach (Johnson et al., 2005). The postmodern perspective believed that play serves the goals of Western society that foster independence, competitiveness, power, and domination in children. Play was seen by non-Western cultures as frivolous and incompatible with values of group loyalty, obedience, respect for elders, co-operation and collectivism" (Shipley, 2012, p.31).

Indigenous Perspectives

Play for many Indigenous nations involves role-playing to learn what their responsibilities will be as an adult. For example, the game of lacrosse was traditionally a men's game that allowed them to develop their stealth and agility skills to be a good hunter. Today, lacrosse is enjoyed by both men and women but skill development still begins very early allowing their abilities to mature over time.

The Play vs Structure Debate

Giving children the freedom to direct their own play is an idea that goes all the back to the philosophy Jean-Jacque Rousseau (1712-1778). Over the next 300 years, this belief fell in and out of favour.

The term "free play" was introduced early in the 20th century. Patty Smith Hall (1868-1946) defined "free play" as follows: "In free play, the self makes its own choices, selections, and decisions, and thus absolute freedom is given to the play of the child's images and volition in expressing them" (Shipley, 2012, p.59-60)

In the 1960s and 1970s, any structure in programs for young children was frowned upon. (Shipley, 2012, p. 59). The pendulum swung back slightly during the 1980s when educators such as David Weikart (1931-2003) advocated that some structure was appropriate to enhance the benefits of play.

The early 1990s ushered in a new emphasis on the importance of the development of children's self-esteem as a curriculum goal. Children were seldom held back in school for not achieving academic goals. Pedagogical practice was praising children for their efforts, not the result. This approach was labelled "child-centered education." Unfortunately, it became incorrectly interpreted as having lower expectations for children. This misinterpretation resulted in the "back to basics" movement that was based on an unsupported linkage between poor results on standardized tests and child-centered education.

In the late 1990s, the Reggio Emilia Approach gained prominence as a successful child-centered, constructivist, curriculum model. This approach balances "both sides of the play versus structure issue, an influence that restored

the credibility of developmental skills as viable outcomes and play-based intervention to help children achieve them." (Shipley, 2012, p.60)

Increasing globalization in the 2000s has renewed the interest of parents in early academic success for their children. It is common for parents to ask Early Childhood Educators "Why do you let the children play all day?" Early Childhood Educators must:

- be knowledgeable about the value of play
- be able to clearly explain the developmental outcomes that children are achieving through play
- be able to make learning visible through documentation.

"Learning success for the information age emphasizes the ability to perform complex tasks and roles." (Shipley, 2012, p.63). 21st century skills that are developed during play include:

- Making choices
- Staying focused for extended periods of time
- Demonstrating understanding
- Social skills such as entering a group, negotiating roles, collaborating with others
- Using divergent thinking skills to solve problems
- Assessing risk

Pause to Reflect

Play activities for children have always been associated with teachings for the Haudenosaunee people and other Indigenous nations of Canada. It provided an opportunity for adults to relay important life lessons to children during their development. This is a practice that continues today.

Take a moment to reflect on how colonization and in particular, the residential school system and sixties scoop negatively affected this important transfer of knowledge from generation to generation.

The Diversity of Beliefs About and Practices of Play

In an extensive and thorough review of international research on adults' beliefs about play, children's play with parents, and children's own play conceptualizes play as "both culturally framed and unframed activities that are subsumed under the umbrella of 'playfulness'".

"As distinguished from conventional definitions of play, playfulness is a more universal phenomenon and includes childhood and parent-child unframed play activities that co-occur during caregiving and in children's encounters with different individuals and objects within specific developmental niches." (Roopnarine, 2011)

When children (or adults) introduce playfulness into what has been initiated as activities other than play, they in fact, at least temporarily, reframes the activity as play(ful). Research has shown that parents differ in their view of the merits of play (Roopnarine, 2011). Parents from what is referred to as European or European- heritage cultures, and particularly among higher-educated middle-class backgrounds, differ in being positive to "'concerted cultivation' during socialization (constantly coaching, creating opportunities) compared to low-income families who believe that children naturally acquire certain skills", including play support. Regarding the latter, there was a positive relationship between play support and parental education, and an inverse relationship between parental education and academic focus, suggesting that parents with higher levels of educational attainment were more likely to endorse play as a means for learning early cognitive and social skills than those with lower levels of educational attainment.

That is, higher-educated parents are more positive to play as a means of facilitating children's development –

and children's development more generally than promoting particular learning outcomes – than lower-educated parents. Among the latter group, "economic and social pressures may lead parents to choose didactic approaches over play in early education in order to minimize the risk of attendant to school failure later on" (Roopnarine, 2011). It is important to realize that what is here referred to as 'didactic approaches' denote practices based on traditional school instruction,

Not surprisingly, but importantly, variation in parental beliefs concerning the value of play corresponds with the frequency, nature and quality of parent-child play, with parents in European and European-heritage communities engaging, for example, in playful activities with children and objects in ways that involve labeling more than parents with other cultural backgrounds.

Unfortunately, the lay view that play is not serious, and thus not important to 'real' education, is still all too common. In their extensive review of studies on play in education, Fisher, Hirsch-Pasek, Golinkoff, Singer, and Berk deduce this controversy to a more long-standing debate on how children learn. They argue that historically there are two traditions to this question, what they refer to as "the 'empty vessel' approach" and "the whole-child perspective" respectively.

The Empty Vessel Approach

Arising from behaviourist philosophies, some believe that there is a core set of basic skills that children must learn and a carefully planned, scripted pedagogy is the ideal teaching practice. In this 'direct instruction' perspective, teachers become agents of transmission, identifying and communicating need-to-know facts that define academic success. Learning is compartmentalized into domain-specific lessons (mathematics, reading, language) to ensure the appropriate knowledge is being conveyed. Worksheets, memorization, and assessment often characterize this approach – with little academic value associated with play, even in preschool.

The Whole Child Approach

In contrast to the empty vessel approach, described by Fisher et al., they present what they refer to as the whole-child approach, in which children themselves are ascribed an active role in their learning, where meaningfulness is critical, and "play, in particular, represents a predominant method for children to acquire information, practice skills, and engage in activities that expand their repertoire". A recurring concept in discussions and theorizing emphasizing children's active participation is **agency.**

In general, the field of early childhood education is most closely aligned with the whole-child approach. However, it is important to remember that making an "either/or" distinction between the two approaches is an oversimplification and one would not expect to find clear-cut examples of either approach. For example, the important roles of more experienced peers, particularly teachers, in children's learning and development are sometimes miscommunicated. Rather than arguing for one or the other approach, it is critical to theorize teaching in play-based activities in more nuanced ways than what "either/or" choices allow.

Reviewing studies on play and learning, Fisher et al. conclude that "the findings show that play can be gently scaffolded by a teacher/adult to promote curricular goals while still maintaining critical aspects of play." What they refer to as 'playful learning' consists of two parts: free play and guided play. The latter has two aspects: adults enriching children's environment with toys and other objects relevant to a curricular domain (e.g., literacy), and adults playing along with children, including critically, asking questions and "the teacher may model ways to expand the child's repertoire (e.g., make sounds, talk to other animals, use it to 'pull' a wagon)". While children's play provides the basis for this form of pedagogy, "teacher guidance will be essential". Teacher guidance, as Fisher et al. point out, "falls on a continuum", that is, the question is not whether or not the teacher participates (or should participate) but the extent to – and more critically, how.

The example of developing preschool children's shape concepts can illustrate the merits of this form of pedagogy. In the study, children were randomly assigned to one of three conditions: guided play, direct instruction, or control condition. In the guided play condition, children were encouraged to "discover the 'secret of the shapes'" and adults asked what the researchers refer to as 'leading questions', such as how many sides there are to a shape. In the instruction condition, in contrast, the adult verbally described the shape properties to the children. In the

control, condition children listened to a story instead of engaging with shapes. Afterward, the children were asked to draw and sort shapes.

Results from a shape-sorting task revealed that guided play and direct instruction appear equal in learning outcomes for simple, familiar shapes (e.g., circles). However, children in the guided play condition showed significantly superior geometric knowledge for the novel, highly complex shape (pentagon) than the other conditions. For the complex shapes, the direct instruction and control conditions performed similarly. The findings suggest discovery through engagement and teacher commentary (dialogic inquiry) are key elements that foster and shape learning in guided play.

This research concluded there is no difference in learning outcomes between guided play and direct instruction when it comes to relatively simple content, but when it comes to more complex content, guided play outperforms direct instruction; in fact, as found, when it comes to complex content, direct instruction was no better than what the control group performed (i.e., in this case, direct instruction made no difference to learning outcomes, on a group level). As clarified by Fisher et al.'s reasoning, teacher participation is critical to the success of guided play, not least to engage children in talking about the matters at hand and how these may be understood.

Pause to Reflect

Haudenosaunee children learn through play and mimicking their parents. For example, a child may have a toy rattle and mimic their parents' actions in a drumming circle. The parent guides the children's actions to help them become more proficient and independent.

Is this an example of the "empty vessel" or "whole child" approach? Why?

Important Things to Remember

- Children are born observers and are active participants in their own learning and understanding of the world around them from the very beginning of their existence.
- There is now evidence that neural pathways in children's brains are influenced by and advanced in their development through the exploration, thinking skills, problem solving, and language expression that occur during play.
- Play is considered so essential to healthy development that the United Nations has recognized it as a specific right for all children.
- Classical theories of play (17th century to late 19th century) attempted to explain **why** people play while dynamic theories of play (20th century onward) attempt to explain **how** people play.
- Culture influences how children's play is viewed and valued.
- Play can be scaffolded by a teacher/adult to promote curricular goals while still maintaining critical aspects of play.

Supplemental Readings

I Have the Right to Play!

A Summary Guide to the UN Convention on the Rights of the Child

The Wisdom of Play: How Children Learn to Make Sense of the World

Talking with Parents about Play and Learning

Corn Husk Doll Teaching

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The Importance of Play

2.1 Characteristics of Play

Play is:

- Active
- Involves pretending and symbolism
- Voluntary
- Meaningful to the child
- Enjoyable for the child
- Episodic, shifting as interests change
- Challenges the child's abilities and imagination (Shipley, 2012, p.36

Rubin, Fein, and Vandenberg (1983) identify six factors that distinguish play from non-play.

1. "Play is intrinsically motivated; that is, it comes from inside the child, and it is not motivated by competition, or by social demands.
2. Play focuses on means, not ends; it is process oriented rather than product oriented.
3. Play occurs when objects are familiar; exploration occurs when objects are unfamiliar or not understood.
4. Play involves pretending, which means engaging in activities that have an "as if," representational, or non-literal quality.
5. Play is free of the externally imposed rules that distinguish play from games.
6. Play is characterized by the active involvement of the participant and, therefore, excludes daydreaming, flitting from one thing to another, and mindless exploration." (Shipley, 2012, p.37)

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2.2 Types of Play

Mildred Parten (1932) observed two- to five-year-old children and noted six types of play. Three types she labeled as non-social (unoccupied, solitary, and onlooker), and three types were categorized as social play (parallel, associative, and cooperative). The table below describes each type of play. Younger children engage in non-social play more than those older; by age five associative and cooperative play are the most common forms of play (Dyer & Moneta, 2006, p.587-592).

Table 1: Parten's Classification of Types of Play

Category	Description
Unoccupied Play (Birth to 3 months)	Children's behavior seems more random and without a specific goal. This is the least common form of play.
Solitary Play (Birth to 2 Years)	Children play by themselves, do not interact with others, nor are they engaging in similar activities as the children around them.
Onlooker Play (2 Years)	Children are observing other children playing. They may comment on the activities and even make suggestions but will not directly join the play.
Parallel Play (2+ Years)	Children play alongside each other, using similar toys, but do not directly interact with each other.
Associative Play (3-4 Years)	Children will interact with each other and share toys but are not working toward a common goal.
Cooperative Play (4+Years)	Children are interacting to achieve a common goal. Children may take on different tasks to reach that goal.

Figure 1: Solitary Play (Photo by Lubomirkin on Unsplash)

2.3 Categories of Play and Related Styles of Play

Table 2.3.1 Categories of Play and Related Styles of Play

Category of Play	Related Styles of Play
Functional Play	• Exploratory play • Repetitive or practice play • Testing play
Symbolic Play	• Imitative play • Pretend play • Dramatic play • Sociodramatic play • Thematic play and sociodrama • Fantasy play • Representational play
Constructive Play	• Productive play • Creative play • Reproductive play
Games with Rules Play	• Rule-bound play • Competitive play

(Shipley, 2012)

Functional Play: Exploring, inspecting, and learning through repetitive physical activity.

- **Exploratory play** in infancy includes behaviors such as filling/emptying, pushing/pulling, and rolling. Exploratory play in toddlerhood includes behaviors such as combining, sorting, transferring items, and manipulating interlocking objects such as Duplo.
- **Repetitive or Practice Play** is when children repeat skills or behaviors they have already mastered; for example, an infant following a moving object with their eyes.
- **Testing Play** is when children challenge their motor abilities; for example, a toddler's first attempts at using a small indoor slide.

Figure 2: Duplo used in exploratory play (Image by Semevent from Pixabay)

Symbolic Play: Using symbols or objects in a way other than their intended purpose.

- **Imitative Play** is the first type of play, evident in infancy, where children simply imitate the actions of a parent or caregiver; for example, children imitating an adult who is clapping their hands.

- Pretend Play involves children using objects, actions, or ideas to represent other objects, actions, or ideas using their imaginations; for example, making a phone call by holding a small unit block up to their ear and talking.

- **Dramatic play** evolves from pretend play, where children start to create their own versions of adult behaviors, rather than just imitating adult behaviors; for example, taking a baby doll for a walk in a stroller.

- **Sociodramatic play** is pretend play with others; for example, one child pretending to make supper and serving it to another child.

- **Thematic Play** is a more complex form of dramatic play, where a familiar theme is present; for example, playing "school."

- Fantasy play involves make-believe characters, rather than real-life characters; for example, children pretending to be Super Heros.

- **Representational play** emerges when children start to use familiar objects in appropriate ways to represent their environment; for example, pretend to cook a meal using pots and pans from the kitchen.

Figure 3: Fantasy play character (Photo by Silvana Carlos on Unsplash)

Constructive Play: Using materials to create or build something.

- **Productive Play** involves using materials to create an intended result: building towers with unit blocks.
- **Creative Play** is a type of productive play that provides more opportunities for self-expression; for example, using modelling clay to make imaginary vehicles to park in a pretend garage.
- **Reproductive Play** is a more advanced form of productive play, where materials are used to recreate real-world objects: for example, using unit blocks to build a garage for toy cars.

Figure 4: Productive Play using blocks (Image by Design_Miss_C from Pixabay)

Games with Rules Play

- This type of play begins the transition from commonly held definitions of "play" (as defined earlier by Rubin, Fein & Vandenberg) to more structured games with externally set rules and expectations. For the purposes of this textbook about creative play, games with rules will not be explored in detail.

2.4 The Value of Play

Young children's ways of learning require an approach to curriculum that allows them to build concepts and skills in integrated learning contexts. Such an approach supports children with analyzing a problem to discover a possible solution, experimenting with, and testing ideas, exchanging ideas with others, thinking creatively, cooperating with others to reach a goal, and focusing their attention and organizing their behavior as they play with others. These skills and dispositions work together to give children a foundation that enhances development and learning in all domains.

Early learning programs use numerous strategies to support children's play, such as observing and documenting, planning the learning environment, providing engaging and appropriately challenging materials, and being responsive to children's interest in engaging in play.

Through observations of children's play, teachers can deepen their appreciation of the value of play in early learning. For example, imaginary play is an important means of exploring ideas and social behavior and roles among preschool-age children. While older infants and toddlers engage in solitary imaginary play, such as feeding a stuffed animal or making a roaring sound while pushing a toy truck across the carpet, preschoolers engage with one or more peers in the more complex and elaborate form of imaginary play called "sociodramatic" play. In this type of play, children cooperate with one another to create a story and "script," assume various roles, figure out appropriate "costumes" and "props," and negotiate new ideas for play, such as, "I want to be a wolf, not a dog!"

Because imaginary play holds such rich potential for promoting children's cognitive, linguistic, social, and physical development, high-quality early learning programs recognize play as a key element of the curriculum. Children's spontaneous play is a window into their ideas and feelings about the world. As such, it is a rich source of ideas for curriculum planning (Lockett 2004). For example, if a teacher observes a group of children repeatedly engaging in imaginary play about illness or hospitalization, she or he might decide to convert the playhouse area into a

veterinary clinic, adding materials to stretch their play. The educator might also read children stories involving doctors, hospitals, getting sick, and getting well. The educator's observations of children's resulting conversations and activities would suggest ways to deepen or extend the curriculum further. In thinking of ways to extend the curriculum, it will be important that teachers ensure that the materials used, and themes built upon are culturally familiar to the children and value children's cultural heritage.

While involved in play, children are challenged to meet the language, problem- solving, and social competencies of their peers. When play is interesting and important to children, they are eager to learn new vocabulary, new physical skills, and new social behaviors that will allow them to stay engaged in play (Jones and Reynolds 2011). Many three-year-old children, for example, have not yet mastered socially appropriate ways to enter other children's play.

Coaching by a sensitive, observant teacher on appropriate language for asking to join play can help a child overcome this hurdle, thereby opening a new area for learning.

When educators regularly observe and document brief, subtle moments of children's learning through play, those records can help families understand how useful and important play is in helping children to learn and grow. For example, a teacher might report a child's language and social development to the parent of a three-year-old: "I watched Sarah standing outside the playhouse area today. Instead of just watching the other children or wandering through their play without getting involved as she often does, she brought the children a book to read to the 'baby' in the family. They asked her if she wanted to be the big sister, and she said yes and joined right in. I have been thinking about ways to help her learn how to use her language to get involved in play with other children, but she figured out her own, creative way to join them."

During the early years, children grow markedly in their knowledge and skills in all areas of development. The dramatic increase in their emotional, social, cognitive, and language knowledge and skills occur hand in hand with the development of key areas of the brain, particularly the prefrontal cortex and its connections with the limbic system. Children are naturally curious and driven to learn about the way the world works and often develop and test hypotheses through observation and experimentation. Children's learning and development in all domains progress well when they are provided with appropriately challenging opportunities for play and exploration, with the support of skilled teachers who scaffold learning experiences.

2.5 What Children Learn Through Play

Just like the "whole child" is often broken down into developmental domains for studying, so too is learning. Many aspects of learning occur simultaneously; it is integrated and connected. To define learning we often break it into categories. Because the connection between play and learning is so important, the way it is broken down exists in many forms. Table 2.5.1 is a compilation of skills tying development into learning.

Table 2.5.1 What Children Learn Through Play

Domain	How it is Tied to Learning

Physical	• Personal care (hygiene, feeding, dressing,)
	• Nutrition
	• Safety
	• Motor (Movement) Skills
	  ◦ Active physical play
	  ◦ Perceptual motor (senses, effort, direction,)
	  ◦ Gross (large) motor (running, throwing, …)
	  ◦ Fine (small) motor (hands, fingers, feet, toes)

Cognitive	• Cognitive approaches to learning and self-regulation
	  ◦ Maintain attention
	  ◦ Self-comfort
	  ◦ Curiosity and initiative
	  ◦ Self-control of feelings and behavior
	  ◦ Engagement and persistence
	• Skills of inquiry
	  ◦ Observe, investigate, document, communicate
	• Knowledge of the natural/physical world
	  ◦ Understanding properties and events
	• Cause and effect
	  ◦ Understanding relationship between cause/effect
	• Classification
	  ◦ Learning the attributes of objects by exploring
	  ◦ Compare, match, sort, categorize
	  ◦ Finding similarities and differences
	  ◦ Symbol
	• Number
	  ◦ Understanding quantity (amount, degree)
	  ◦ Assigning a numerical symbol to quantity
	  ◦ Counting
	• Measurement
	  ◦ Awareness of difference in properties
	  ◦ (Size, length, weight, capacity, volume)
	  ◦ Seriation (order 3 or more by comparison)
	  ◦ (small/medium/large, loud/louder/loudest)
	  ◦ Time (sequence of events, rhythm, yesterday/ tomorrow)
	• Patterning
	  ◦ Recognize, reproduce, repeating sequences
	• Spatial relationships
	  ◦ Experience an object's position in relation to others

Language	• Symbol/symbolic reasoning
	  ◦ Sounds and letters are put together to represent things
	• Receptive language
	  ◦ Listening, understanding, responding
	• Expressive language
	  ◦ Speaking, communicating, conversation
	• Graphic (written) language/literacy
	  ◦ Interest in print & books, phonology, pre-reading, reading
	  ◦ Symbol, letter, print knowledge, pre-writing, writing

Social	• Skills learning with adults
	  ◦ Can stay at school without parent
	  ◦ Can respond/enjoy adults other than parents
	  ◦ Adults will help in times of need
	  ◦ Adult will not always solve problems
	
	• Skills learned with peers
	  ◦ Different approaches work for different peers
	  ◦ Cooperation and turn taking
	  ◦ Lead and follow
	  ◦ Sustain relationships and helping peers
	  ◦ Share materials, equipment, people, ideas
	  ◦ Asserting rights and self defense
	  ◦ Negotiating skills and solving conflicts
	  ◦ Anticipate and avoid problems
	  ◦ Realistic expectations and valuing differences
	
	• Skills learning in a group
	  ◦ Respect
	  ◦ Responsibility
	  ◦ Compassion
	  ◦ Tolerance
	  ◦ Group identity
	  ◦ Follow and adapt to routines and expectations
	  ◦ How to enter and exit situations
	  ◦ Deal with delay of gratification (patience)
	
	• Skills learned as an individual
	  ◦ Self-help and self-care
	  ◦ Make choices and initiate own activities
	  ◦ Cope with rejection, hurt feelings, disappointment
	  ◦ Take responsibility

Emotional	• Ability to deal with feelings
	  ◦ Notice, label, and accept feelings
	  ◦ Express feelings in appropriate ways
	  ◦ Deal with the feelings of others
	  ◦ Resolve inner fears, conflicts
	
	• Ability to exercise judgment
	  ◦ Notice, label, and make choices
	  ◦ Think through consequences
	  ◦ Evaluate the effectiveness of choices
	  ◦ Learn to take another viewpoint
	
	• Enjoying oneself and one's power
	  ◦ Acquire a sense of self
	  ◦ Develop self-confidence and self-esteem
	  ◦ Build trust in self and others
	  ◦ Reveal own personality
	  ◦ Learn to take risks & learn from mistakes
	  ◦ Become competent in several areas

Creative	• Flexibility (shifting from 1 idea to another) • Fluency (producing many ideas) • Sensitivity (awareness (moods, textures, senses,) • Imagination / Originality • Risk Taking / Elaboration (pushing boundaries) • Self as a resource (awareness, confidence in ability) • Experience (to build proficiency to build upon) • Visual and Performing Arts

Figure 5: Play is active learning (Image by Hai Nguyen Tien from Pixabay)

Pause to Reflect

Figure 5 Indigenous Infant and a cradleboard (Image provided by author)

Haudenosaunee and Anishinaabe families use cradleboards to carry their infants from birth to toddler stages. As the infant develops, various objects such as leather straps, shells, and beadwork are securely attached to the rainbow (top) of the cradleboard to attract their attention and develop visual acuity and observation skills. Older children play with infants in the cradleboard, often mimicking their parents' actions and language.

Which developmental domains are activated with the use of a cradleboard?

2.6 The Freedom of Play and Open-endedness

One of the hallmarks of early childhood education is what is typically referred to as 'free play.'
In his theoretical elaboration of play, van Oers (2014) differentiates the notion of 'free play' into two concepts: freedom from and freedom to. As he emphasizes, in discussions about 'free play,' children's right to play free of adult 'interference', as it is often labelled – clearly indicating the negative connotations of teacher participation in these kinds of activities – is emphasized, that is, what he refers to as freedom from. However, he further argues, the freedom of play may be differently understood; as the freedom to pursue activities in unforeseeable directions, that is, being responsive to the inherent open-endedness of activities we call play. This latter conceptualization of the freedom of play is what he refers to as freedom to; that is, children are free to explore and pursue what they engage in without needing to know beforehand where it will lead them. Where their play may end up, does not, van Oers emphasizes, preclude teacher participation in these activities.

Pause to Reflect

Figure 6 Children at Fort Simpson Indian Residential School (Biblio Archives flickr)

It is estimated that over 150 000 Indigenous children attended residential schools in Canada. The last residential school closed in 1996.

The Indian Act of 1876 made it compulsory for every Indigenous child to attend residential school from the ages of 4 – 16. The schools were often a significant distance from their communities to minimize interactions with their family. Most children were forcibly removed from their families and segregated from siblings. Strict rules were enforced to ensure that Indigenous children adopted the languages, culture, and ways of life of mainstream society. Many children were abused.

How do you think the residential school system impacted typical childhood development?

Important Things to Remember

- Play is defined as an activity that is: active, voluntary, episodic, meaningful, and enjoyable for the child, involves pretending and symbolism, and challenges a child's abilities and imagination.
- There are six types of play in Parten's classification of play: unoccupied, solitary, onlooker, parallel, associative, and cooperative.

- There are four categories of play: functional, symbolic, constructive, and games with rules.
- Children's spontaneous play is a window into their ideas and feelings about the world and is a rich source of ideas for curriculum planning.
- Skill development in different domains is integrated, connected, and can occur simultaneously.
- "Free Play" is when children are free to explore and pursue what they engage in without needing to know beforehand where it will lead them. Where their play may end up does not preclude teacher participation in these activities.

Supplemental Readings

Unstructured Play for Children

Five Essentials to Meaningful Play

Key Aspects of Play in Early Education

The Effect of Residential Schools

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Pedagogical Foundations and Models

"Pedagogy is about how learning takes place. Play is a child-centered activity that engages a young child and promotes learning (Berk & Winsler, 1995; Kagan & Britto, 2005; Kagan & Lowenstein, 2004; Greenspan & Shanker, 2004).

Play is how children make sense of the world and is an effective method of learning for young children. Ideas and skills become meaningful; tools for learning are practiced; and concepts are understood.

Play engages children's attention when it offers a challenge that is within the child's capacity to master. Early childhood settings that value children's play create a "climate of delight" that honours childhood (ETFO, 1999). Effective settings take advantage of play and embed opportunities for learning in the physical environment and play activities.

Children who thrive in primary school and whose pathways are set for later academic success are those who enter Grade 1 with strong oral communication skills, are confident, able to make friends, are persistent and creative in completing tasks and solving problems and excited to learn (Shonkoff & Phillips, 2000; Bennett, 2004; National Research Council, 2001; Sylva et al., 2004; Maggi et al., 2005). These are the same qualities that children strengthen through high-quality play during their early years." (Excerpts from ELECT, p.9)

3.1 How Does Learning Happen? Foundations for Learning

"Pedagogical approaches that nurture learning and development in the early years include:

- establishing positive, responsive adult-child relationships.
- providing inclusive learning environments and experiences that encourage exploration, play, and inquiry
- engaging as co-learners with children, families/caregivers, and others.
- planning and creating environments as a "third teacher."
- using pedagogical documentation as a means to value, discuss, and make learning visible.
- participating in ongoing reflective practice and collaborative inquiry with others." (How Does Learning Happen? pg.16)

How Does Learning Happen? sets out four foundations for learning: belonging, well-being, engagement and expression. Linkages to the role of play in learning are particularly strong in the foundations of engagement and expression.
"Engagement suggests a state of being involved and focused. When children are able to explore the world around them with their natural curiosity and exuberance, they are fully engaged. Through this type of play and inquiry, they develop skills such as problem solving, creative thinking, and innovating, which are essential for learning and success in school and beyond." (How Does Learning Happen? p.7)

- Research has proven that children learn best in environments that enable them to be fully involved in meaningful exploration, spontaneous play, and inquiry. (How Does Learning Happen? p.35.)
- Engagement is supported when educators are co-learners, valuing children's ideas and contributions.
- The environment itself directly impacts children's opportunities to become fully engaged in their play. A neatly organized assortment of open-ended materials encourages exploration and play. It is equally important to ensure children are given long periods of time to become fully engaged in their play.

"Expression or communication (to be heard, as well as to listen) may take many different forms. Through their bodies, words, and use of materials, children develop capacities for increasingly complex communication. Opportunities to explore materials support creativity, problem-solving, and mathematical behaviours. Language-rich environments support growing communication skills, which are foundational for literacy." (How Does Learning Happen? p.8)

- Supportive early learning environments enable children to communicate and express themselves in a wide variety of forms.
- Children can communicate their thoughts and feelings verbally, non-verbally, and through creative expression.
- How Does Learning Happen? emphasizes the importance of valuing a child's first language and culture as a means of expression.

Indigenous Perspective

The family structure of the Haudenosaunee involves extended family such as cousins, aunties, uncles, and grandparents. Through this family unit, a child is fully supported as they learn to explore their world. Children who are engaged by family members of a variety of ages develop the capacity to communicate on multiple levels including both verbal and non-verbal methods.

3.2 Developmentally Appropriate Practice

Developmentally Appropriate Practice (DAP), as outlined by NAEYC (National Association for the Education of Young Children), challenges early childhood professionals to be intentional in their interactions and environments to create optimal experiences to maximize children's growth and development. Under this umbrella of DAP, knowledge is based upon discovery and discovery occurs through active learning and abundant opportunities for exploration. Through a "hands-on" approach and using play as a vehicle, children will develop skills in domains necessary for growth and development.

Pause to Reflect

Consider your childhood. Were you presented with toys that were specific to a culture? We can find and intentionally include toys from other cultures that will spark new language and appreciation.

According to the National Association for the Education of Young Children's Position Statement, "The core of developmentally appropriate practice lies in... intentionality, in the knowledge that practitioners consider when they are making decisions, and in their always aiming for goals that are both challenging and achievable for children." To do this, they must use developmentally appropriate practice (DAP). DAP includes three areas of knowledge:

1. Age-appropriateness – using what is known about child development and learning in general.
2. Individual-appropriateness – using what is known about each child as an individual to be responsive to

each child.

3. Social- and cultural-appropriateness – using what is known about the social and cultural context in which children live. (NAEYC, 2019)

Head Start has guiding principles that reflect developmentally appropriate practice by an intentional teacher:

- Each child is unique and can succeed
- Learning occurs within the context of relationships.
- Families are children's first and most important caregivers, teachers, and advocates.
- Children learn best when they are emotionally and physically safe and secure.
- Areas of development are integrated, and children learn many concepts and skills at the same time. Teaching must be intentional and focus on how children learn and grow.
- Every child has diverse strengths rooted in their family's culture, background, language, and beliefs. (Head Start Early Learning Outcomes Framework)

3.3 Bank Street Model

Lucy Sprague Mitchell founded Bank Street, an Integrated Approach, also referred to as the Developmental-Interactionist Approach.

In this model, the environment is arranged into learning centers and planning is organized using materials within the learning areas (centers).

- Art
- Science
- Sensory/Cooking
- Dramatic Play
- Language/Literacy
- Math/Manipulative/Blocks
- Technology
- Outdoors: Water and Sand Play

 The Bank Street Model of curriculum represents the ideology of Freud, Erikson, Dewey, Vygotsky, and Piaget. This model draws upon the relationship between psychology and education. By understanding developmental domains and creating interest centers with materials that promote specific areas of development, children's individual preferences and paces of learning are the focus.
"A teacher's knowledge and understanding of child development is crucial to this approach. Educational goals are set in terms of developmental processes and include the development of competence, a sense of autonomy and individuality, social relatedness and connectedness, creativity, and integration of different ways of experiencing the world" (Gordon, p.364)

3.4 Creative Curriculum Model (Diane Trister Dodge)

In the Creative Curriculum model, the focus is primarily on children's play and self-selected activities. The Environment is arranged into learning areas and large blocks of time are given for self-selected play. This model focuses on project-based investigations as a means for children to apply skills and addresses four areas of development: social/emotional, physical, cognitive, and language.

The curriculum is designed to foster the development of the whole child through teacher-led, small, and large group activities centered around 11 interest areas:

- blocks
- dramatic play
- toys and games
- art
- library
- discovery
- sand and water
- music and movement
- cooking
- computers
- outdoors.

 The commercial curriculum provides educators with details on child development, classroom organization, teaching strategies, and engaging families in the learning process. Child assessments are an important part of the curriculum but must be purchased separately. Online record-keeping tools assist educators with the maintenance and organization of child portfolios, individualized planning, and report production. (The Creative Curriculum for Preschool)

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3.5 High Scope Model (David Weikert)

The High Scope Model focuses on developing learning centers like the Bank Street Model and emphasizes key experiences for tracking the development. The key experiences are assessed using a Child Observation Record for tracking the development and include areas of:

- Creative Representation
- Initiative
- Social Relations
- Language and Literacy
- Math (Classification, Seriation, Number, Space, Time)
- Music and Movement

The High Scope Model also includes a "Plan-Do-Review" Sequence in which children begin their day planning for activities they will participate in, followed by participation in the activities and engaging in a review session at the end of the day. Educators can use this sequence format to help children learn how to organize choices of activities and to reflect upon what they liked or would do differently at the end of the day. The High Scope Model reflects the theories of Piaget, Vygotsky, and Reggio Emilia by way of emphasis on the construction of knowledge through hands-on experiences with reflection techniques.

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3.6 Montessori Approach (Dr. Maria Montessori)

The Montessori Approach refers to children's activity as work (not play); children are given prolonged periods of time to work and a strong emphasis on individual learning and the individual pace is valued. Central to Montessori's method of education is the dynamic triad of child, educator, and environment. One of the educator's roles is to guide the child through what Montessori termed the 'prepared environment, i.e., a classroom and a way of learning that is designed to support the child's intellectual, physical, emotional, and social development through active exploration, choice, and independent learning.

The educational materials have a self-correcting focus and areas of the curriculum consist of art, music,

movement, and practical life (for example, pouring, dressing, and cleaning). In the Montessori method, the goal of education is to allow the child's optimal development (intellectual, physical, emotional, and social) to unfold.

A typical Montessori program will have mixed-age grouping. Children are given the freedom to choose what they work on, where they work, with whom they work, and for how long they work on any activity, all within the limits of the class rules. No competition is set up between children, and there is no system of extrinsic rewards or punishments.

Figure1: A Montessori toy (Photo by Jackie Hope on Unsplash)

3.7 Waldorf Approach (Rudolf Steiner)

The Waldorf Approach, founded by Rudolf Steiner, features connections to nature, sensory learning, and imagination. The understanding of the child's soul, of his or her development and individual needs, stands at the center of Steiner's educational worldview.

The Waldorf approach is child-centered. It emerges from a deep understanding of child development and seeks to support the developmental tasks (physical, emotional, and intellectual) children face at any given stage. Children aged 3–5, for example, are developing a keen interest in the world, supported to a significant extent by freedom

of movement, and must be supported to follow and deepen their curiosity through the encouragement of their sometimes endless asking of questions (Van Alphen & Van Alphen 1997). This approach to supporting children's naturally blossoming curiosity, rather than answering the educators' questions. At this stage, children's play becomes increasingly complex, with children spontaneously engaging in role plays, as they construct and act upon imaginative situations based on their own experiences and stories they have heard. Thus, in Waldorf schools, ample time is given for free imaginative play as a cornerstone of children's early learning.

The environment should protect children from negative influences and the curriculum should include exploring nature through gardening, but also developing practical skills, such as cooking, sewing, cleaning, etc. Relationships are important so groupings last for several years, by way of looping.

3.8 Reggio Emilia Approach (Loris Malaguzzi)

The Reggio Emilia approach to early childhood education is based on over forty years of experience in the Reggio Emilia Municipal Infant/toddler and Preschool Centers in Italy. Central to this approach is the view that children are competent and capable.
It places emphasis on children's symbolic languages in the context of a project-oriented curriculum. Learning is viewed as a journey and education as building relationships with people (both children and adults) and creating connections between ideas and the environment.

Through this approach, adults help children understand the meaning of their experience more completely through documentation of children's work, observations, and continuous educator-child dialogue. The Reggio approach guides children's ideas with provocations—not predetermined curricula. There is collaboration on many levels: parent participation, educator discussions, and community.

Within the Reggio Emilia schools, great attention is given to the look and feel of the classroom. The environment is considered the "third teacher." Educators carefully organize space for small and large group projects and small intimate spaces for one, two, or three children. Documentation of children's work, plants, and collections that children have made from former outings are displayed both at the children's and adults' eye level. Common space available to all children in the school includes dramatic play areas and worktables.

There is a center for a gathering called the atelier (art studio) where children and children from different classrooms can come together. The intent of the atelier in these schools is to provide children with the opportunity to explore and connect with a variety of media and materials. The studios are designed to give children time, information, inspiration, and materials so that they can effectively express their understanding through the "inborn inheritance of our universal language, the language that speaks with the sounds of the lips and of the heart, the children's learning with their actions, their signs, and their eyes: those "hundred languages" that we know to be universal. There is an atelierista (artist) to support this process and instruct children in arts.
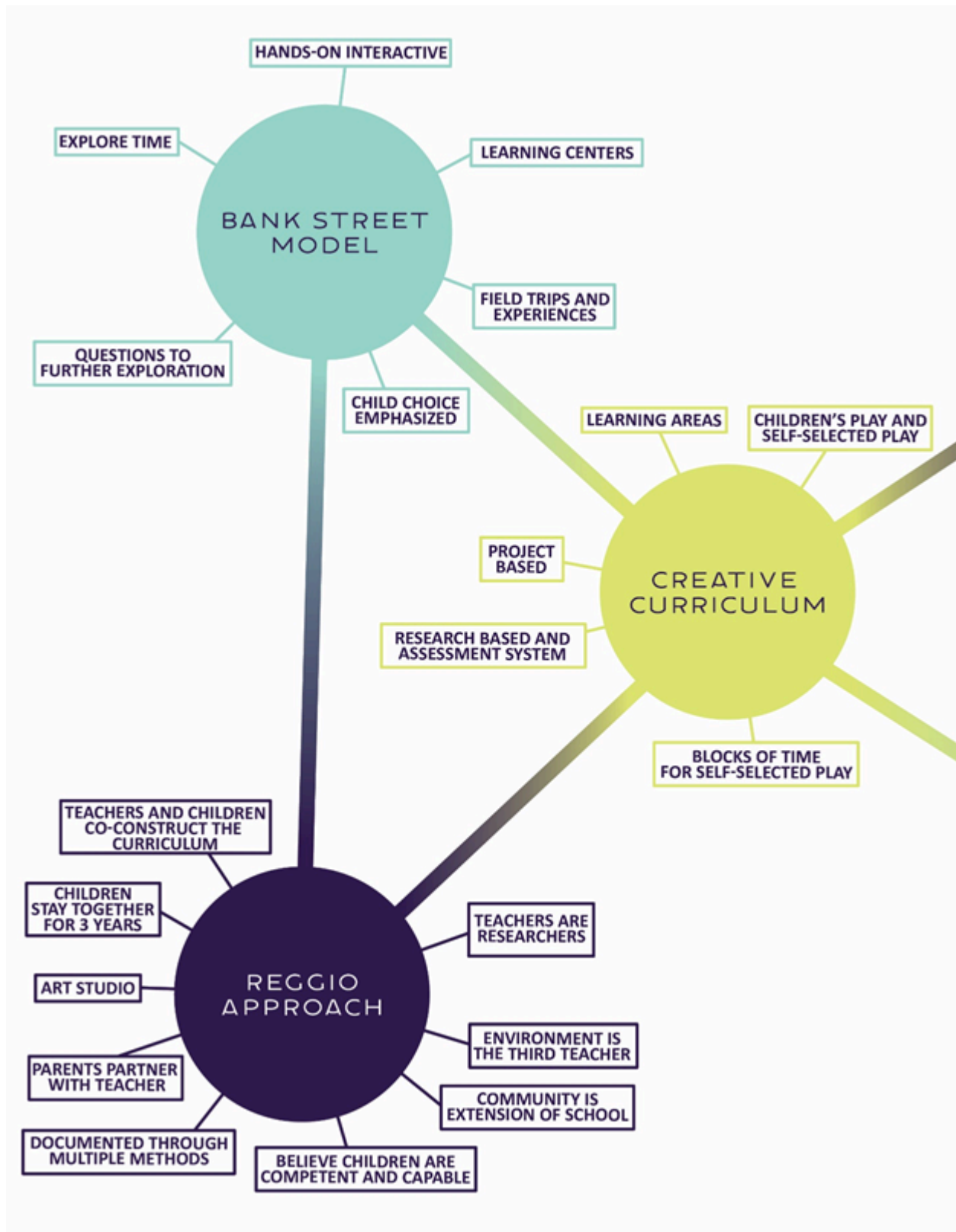
Figure 2: Curriculum Models (Image by Ian Joslin)
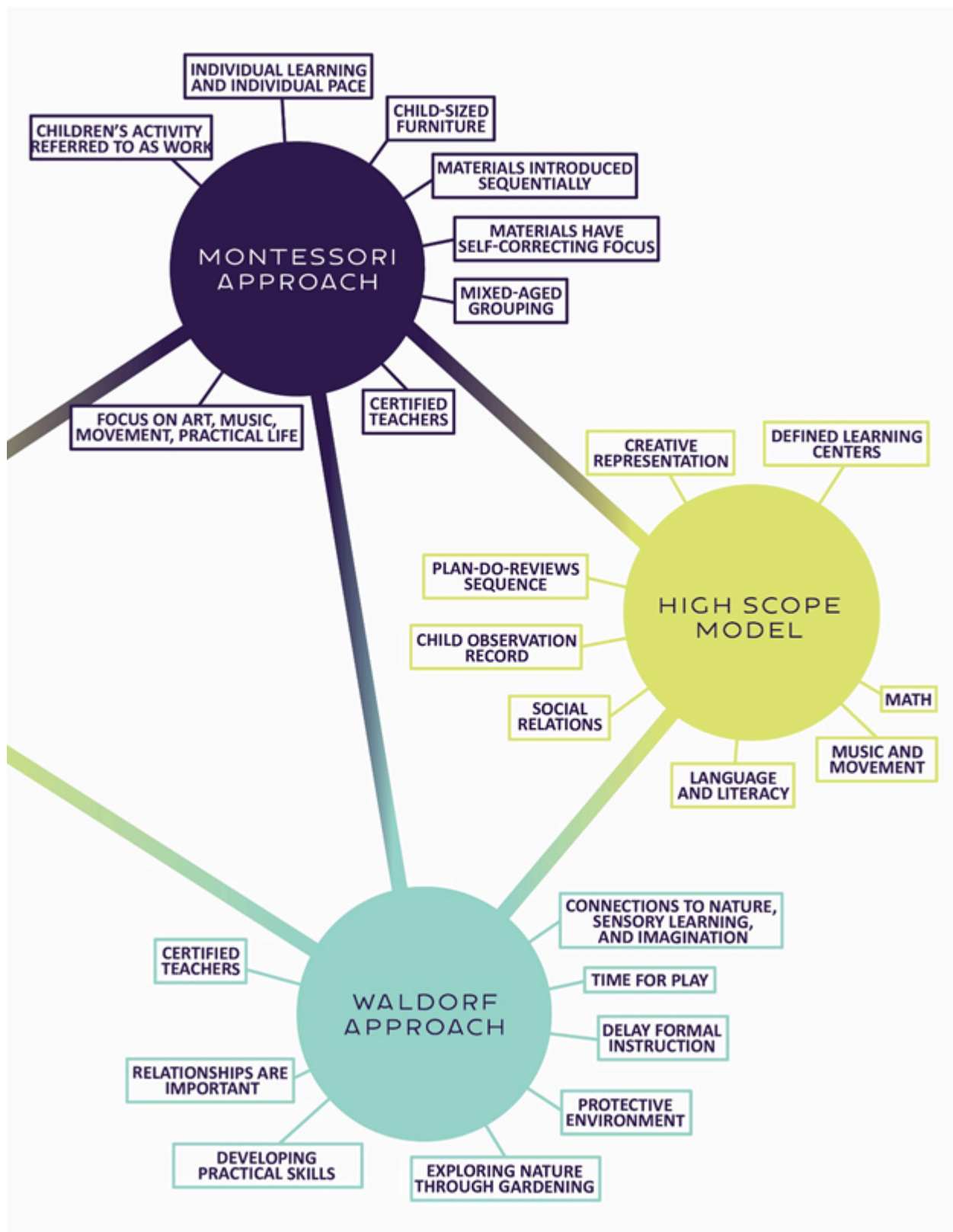
Figure 3: Curriculum Models. (Image by Ian Joslin)

3.9 Webbing

The Reggio Emilia Approach is an emergent curriculum. One method that many Early Childhood Educators use

when planning emergent curriculum is curriculum webbing based on observed skills or interests. This method uses brainstorming to create ideas and connections from children's interests to enhance developmental skills. Webbing can look like a "Spider's Web," or it can be organized in list format

Figure 4: An example of webbings. (Image by Ian Joslin)

Webbing can be completed by:

- An individual educator
- A team of educators
- Educator and Children
- Educators, Children, and Families

Webbing provides endless planning opportunities as extensions continue from observing the activities and following the skills and interests exhibited. As an example demonstrates a web can begin from a skill to develop, but it can also be used in a Theme/Unit Approach such as transportation; friendships; animals, nature, etc.

3.10 Project Approach

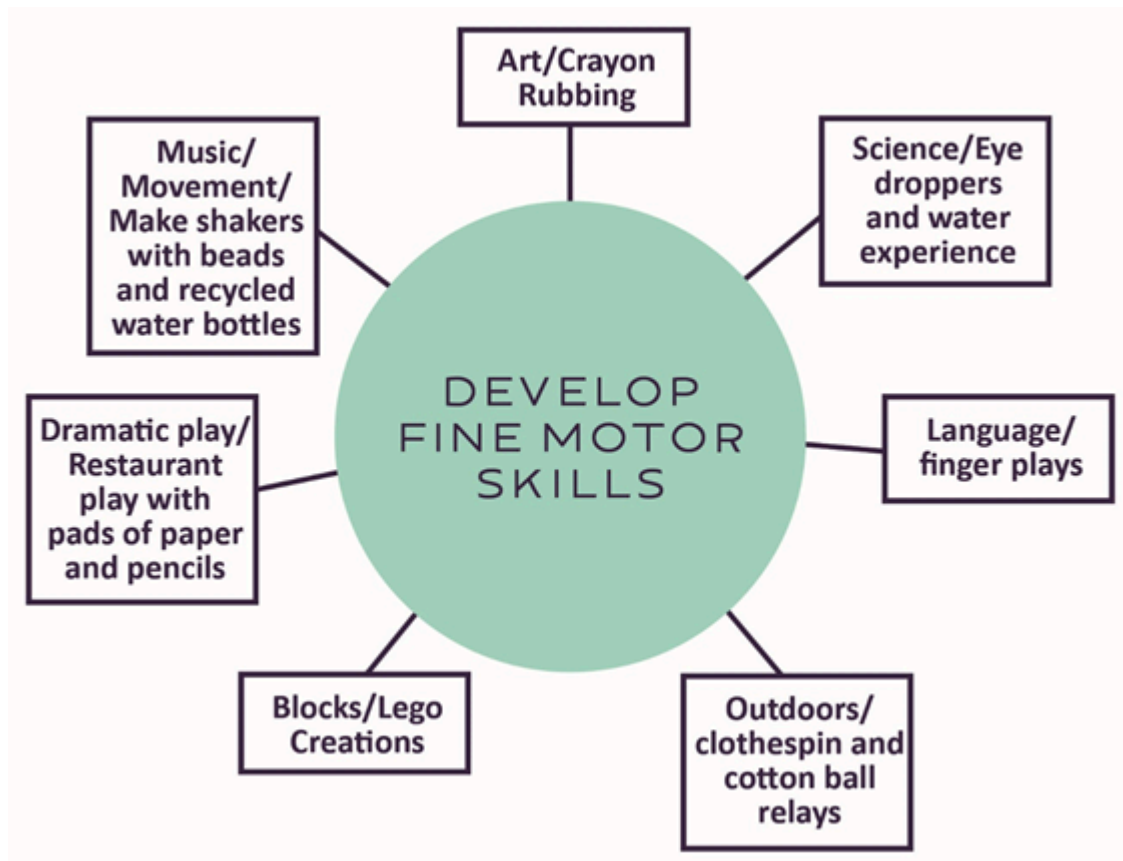The project approach is an in-depth exploration of a topic that may be child-or educator-initiated and involve an individual, a group of children, or the whole class. A project may be short-term or long-term depending on the level of children's interests. What differentiates the project approach from an inquiry one is that within the project approach, there is an emphasis on the creation of a specific outcome that might take the form of a spoken report, a multimedia presentation, a poster, a demonstration, or a display. The project approach provides opportunities for children to take agency of their own learning and represent this learning through the construction of personally meaningful artifacts. If utilized effectively, possible characteristics may include active, agentic, collaborative, explicit, learner-focused, responsive, scaffolded, playful, language-rich, and dialogic.

In the project approach, adults and children investigate topics of discovery using six steps: Observation, Planning, Research, Exploration, Documentation, and Evaluation.

1. Observation: An educator observes children engaging with each other or with materials and highlights ideas from the observations to further explore.
2. Planning: Educators talk with children about the observation and brainstorm ideas about the topic and what to explore
3. Research: Educators find resources related to the topic
4. Explore: Children engage with experiences set around the topic to create hypotheses, make predictions, and formulate questions
5. Documentation: Educators write notes, and create charts and children draw observations and fill in charts as they explore topics/questions
6. Evaluate: Educators and children can reflect on the hypotheses originally developed and compare their experiences to predictions. Evaluation is key in determining skills enhanced and what worked or what did not work and why.

The benefits of a project approach are that young learners are directly involved in making decisions about the topic focus and research questions, the processes of investigation, and the selection of the culminating activities. When young learners take an active role in decision-making, agency, and engagement is promoted.

3.11 Culturally Appropriate Approach

The Cultural Appropriate Approach has evolved over the years and the practice of valuing children's culture is imperative for children to feel a sense of belonging in ECE (Early Childhood Education) programs. Sensitivity to the variety of cultures within a community can create a welcoming atmosphere and teach children about differences and similarities among their peers. Consider meeting with families prior to starting the program to share cultural beliefs, languages, and or traditions.

Classroom areas can reflect the cultures in many ways:

- **Library Area:** Select books that represent cultures in the classroom
- **Dramatic Area:** Ask families to donate empty boxes of foods they commonly use, bring costumes or clothes representative of the culture
- **Language:** In writing center include a variety of language dictionaries
- **Science:** Encourage families to come and share a traditional meal

Pause to Reflect

Should children be given the opportunity to engage with Indigenous toys or crafts without understanding their connection to a specific nation?

What is the responsibility of the educator in this situation?

How can families play a role in sharing?

Important Things to Remember

- Play is how children make sense of the world and is an effective method of learning for young children. Ideas and skills become meaningful; tools for learning are practiced; and concepts are understood.
- Play engages children's attention when it offers a challenge that is within the child's capacity to master.
- Research has proven that children learn best in environments that enable them to be fully involved in meaningful exploration, spontaneous play, and inquiry.
- Supportive early learning environments enable children to communicate and express themselves in a wide variety of forms: verbally, non-verbally, and through creative expression.
- Areas of development are integrated, and children learn many concepts and skills at the same time.
- Developmentally appropriate practices are age-appropriate, individually appropriate, and socio-culturally appropriate.

Supplemental Readings

How Does Learning Happen?

CECE Practice Guideline: Pedagogical Practice

Webbing: Ready, Set, Learn! We're Off to the Moon

Encouraging Indigenous Cultural Identity

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Role Play

4.1 Daily Living Role Play

Daily living role play (also sometimes referred to as "dramatic play") is a valuable part of the early year's curriculum. Children under 36 months engage in role-play by imitating the use of everyday items such as phones and stirring pots. Daily living role play typically progresses from the time a child is 36 months old when they engage almost exclusively in solitary play and in watching others play; to the equal time engaged in solitary, parallel, and group play at 48 months; and to primarily group play with some solitary and parallel play at 60 months. During the early years, role play should be about the process of creating and exploring, rather than an end product, such as a rehearsed play or other formal performance.

Figure 1: Daily Living Role Play (image by Kampus Production)

Educators can support daily living role play for all age groups with the following:

- Observe dramatic play and role-playing.
- Step in or model when needed.
- Provide adaptations to support the participation of children with disabilities or other special needs. This may include pre-teaching, using pictures, sign language, and other multisensory enrichment, modified equipment/props, etc.
- Use a drama-based vocabulary. For example, blocking, actors, stage, scenery, voice, props, etc.
- Encourage children to use drama-based vocabulary.
- Encourage and model the expression of interests and preferences.

- Encourage and allow initiative.
- Model and note appropriate ways of using drama materials.
- Move in and out role as appropriate (decide when to participate and when to facilitate).
- Use costumes, props, and scenery to inspire dramatic play and drama.
- Facilitate children's engagement in drama by first discussing expectations.
- Scaffold and encourage children during and after participating in drama to build their understanding and use of plot.

Pause to Reflect

How important do you think it is for children to have dolls that are culturally appropriate (clothing, range of skin colour, eye colour, and eye shape) for their dramatic play?

What other toys and materials can offer a representation of different ethnicities, expanding their role play?

4.2 Suggested Materials for Daily Living Role Play

Table 4.1 Suggested Material for Daily Living Role Play

Type of Materials	Examples of Materials
Found or Recycled Materials	Scarves, sashes, and fabric remnants varying in size, color, design, and texture for a costume area; include strips of furry fabric to be used as animal tails. Wooden spoons, paint sticks, paper towel and wrapping paper tubes, yarn, and boxes can work as nonrepresentational props where children create meaning.
Basic	Large and small blocks; stuffed animals; dolls; wooden or plastic fruits and vegetables
Enhanced	Puppets; textual props such as menus and signs; large pieces of blue, green, yellow, brown, and floral fabric to depict rivers, grass, dirt (for "planting" vegetables), and flower gardens; headbands with several types of animal ears sewn on
Natural Environment	Wood, tree cookies, and other materials for building; pinecones, feathers, smooth stones, and pebbles
Adaptive Materials	Consider props that are easy to use and handle (e.g., oversized objects and items without many complicated pieces). Adapt clothing and fabric by removing buttons, enlarging openings, and so on for ease of wearing.

Figure 2: Learning about different jobs through role play (photo by Amina Filkins)

4.3 THE VALUE OF ROLE PLAY

Role play is when children have a role to play and, during a small scenario, they speak and act in that role, adopting the behaviors and motives of the character they are playing. No script is provided, but it is important that children are given enough information by the educator to be able to assume the role. The children enacting the roles should also be encouraged to express their thoughts and feelings spontaneously.

Role play has several advantages because it:

- explores real-life situations to develop an understanding of other people's feelings
- promotes the development of decision-making skills
- actively engages children in learning and enables all children to contribute
- promotes a higher level of thinking.

Role play can help younger children develop the confidence to speak in different social situations, for example, pretending to shop in a store, purchase a ticket, or order at a restaurant. You can set up simple scenes with a few props and signs, such as 'Café', 'Grocery Store' or 'Garage'. Ask children, 'Who works here?', 'What do they say?' and 'What do we ask them?' and encourage children to interact in the role of the mechanic, observing their language use.

Role play can develop older children's life skills. For example, before and after school programs, you may be

exploring how to resolve conflict. You can describe a similar but detached scenario that exposes the same issues. Assign children roles or ask them to choose one for themselves. You may give them planning time or just ask them to role-play immediately. The role play can be shared with the class, or children could work in small groups so that no group is being watched. Note that the purpose of this activity is the experience of role-playing and what it exposes; you are not looking for polished performances or Bollywood actor awards.

It is also possible to use role-play in science and math. Children can model the behaviors of atoms, taking on characteristics of particles in their interactions with each other or changing their behaviors to show the impact of heat or light. In math, children can role-play angles and shapes to discover their qualities and combinations.

Using drama in the classroom is a good strategy to motivate most children. Drama develops skills and confidence and can also be used to assess what children understand about a topic. A drama about children's understanding of how the brain works could use pretend telephones to show how messages go from the brain to the ears, eyes, nose, hands, and mouth, and back again. Or a short, fun drama on the consequences of forgetting how to subtract numbers could fix the correct methods in young children's minds.

For school-age children, drama often builds towards a performance for the rest of the class, the school, or for the parents and the local community. This goal will give children something to work towards and motivate them. The whole class should be involved in the creative process of producing a drama. It is important that differences in confidence levels are considered. Not everyone must be an actor; children can contribute in other ways (organizing, costumes, props, stagehands) that may relate more closely to their talents and personality.

It is important to consider why you are using drama to help children learn. Is it to develop language (e.g., asking and answering questions), subject knowledge (e.g., the environmental impact of mining), or to build specific skills (e.g., teamwork)? Be careful not to let the learning purpose of drama be lost in the goal of the performance.

Pause to Reflect

What is your comfort level in role play? Will your confidence in acting out be a barrier to providing a rich environment with props and opportunities for children?

Before and after-school programs often do not have a 'permanent' set-up classroom. How can you include drama experiences outside and in open spaces?

Important Things to Remember

- During the early years, role play should be about the process of creating and exploring, rather than an end product, such as a rehearsed play or other formal performance.
- Role play provides opportunities for children to explore real-life situations and to develop the ability to understand other people's feelings.
- Role play promotes the development of decision-making skills.
- Role play actively engages children in learning and enables all children to contribute in ways that value their talents and personalities.
- Role play promotes a higher level of thinking.

Supplemental Readings

Dramatic Play: What it is and Why its Important

6 Reasons Why Dramatic Play Matters

Importance of Role Play

Music and Movement

5.1 Music

When children develop an awareness and knowledge of musical elements, children progress in their understanding and ability to control the elements for personal musical expression. Although early childhood music education is primarily about introducing the child to musical sounds and holistic experiences that are of the highest quality, enriched learning occurs when the child understands and ability to manipulate the music elements of rhythm, melody, form, loudness/softness, tempo, timbre, articulation, and style.
Educators can support music with the following:

- Find ways to expose children to music being conducted and performed.
- Provide music areas where children can experience instruments or musical activities as individuals or in a small group.
- Set up a "Science of Sound" area where children can explore and experiment with building sounds.
- Provide a conductor's listening and play area.
- Make instruments with the children.
- Incorporate chant games and songs related to sound production.
- Include a variety of songs that related to a particular topic area.
- Use songs that have movements or gestures that accompany the words.
- Provide children with an opportunity to conduct the group by singing or playing instruments.
- Dramatize poetry and nursery rhymes as a fun way to explore and develop vocal inflection and pitch capabilities in the young singer.
- Invite young children to move through instrumental program music, or music that "tells a story."
- Invite local professional musicians or family members to demonstrate and talk about their instruments and the sounds made.
- Invite live musicians for the children to conduct; encourage the child conductor to stop and start, go faster and slower, and give arm gestures for louder and softer sounds.
- Incorporate books related to music. Include storybooks on conductors and orchestras.
- Encourage children to create simple rhythm patterns.
- Extend learning about different ways to lead a music group.
- Incorporate freeze-and-move games as a fun, simple way to help children develop control of the body in space and to learn and practice fundamental locomotor movements.
- Provide opportunities for independent and group play through musical play kits, which can be stored in a music area.
- Incorporate the use of websites of children's music and other age-appropriate software (if available), to engage children's interest in sound
- Encourage children to be playful and spontaneous when singing—they often sing made-up songs as they

play alone or with other children.

- Minimize the use of recorded music when the goal is singing.

- Have the children draw pictures of songs.

Table 5.1 Suggested Materials for Music

Type of Materials	Examples of Materials
Found or Recycled Materials	Pots, pans, metal or plastic cans, spoons, chopstick-beaters with cork stoppers for rhythm Glass jars filled with various levels of water for a water xylophone Pieces of 12" dowel for rhythm sticks; shakers made of plastic eggs filled with varied materials.
Basic	Rhythm sets with shakers and simple drums Singable books; glove puppets for nursery rhyme songs; song maps made of paper or fabric; selection of CDs, CD player, and headset for personal listening, use of streamed music.
Enhanced	Single-note resonator bells; child-sized xylophones; multiple-sized hand drums; ethnic instruments; child- sized guitar or ukulele; small electronic keyboard; recorder/flute; music software; music videos; songbooks.
Natural Environment	Rhythm blocks made of small tree limbs; homemade wooden or stone xylophones suspended on a garden hose; wind chimes made of natural objects.
Adaptive Materials	Thicker handles on some materials; instruments in a fixed position, such as a drum on a stand. For children with reduced hearing ability, instruments that resonate and vibrate allow for touching or holding.

Figure 1: Music Experiences for Infants (Image by thedanw from Pixabay)

Indegenous Perspectives

Figure 2: Powwow (Govisible Galleries)

Indigenous nations have a love of music and dance. Ceremonial songs are sacred and connected with specific events such as maple syrup, strawberry, and bean seasons. Social songs can be used at any time and are for the enjoyment of the people. Babies and children participate with their families in both drumming and dancing. They learn the steps through observation.

5.2 Movement

Dance and movement are an inherent part of life and are as natural as breathing. Dance is an elemental human experience and a means of expression. It begins before words are formed, and it is innate in children before they use language to communicate. It is a means of self-expression and can take on endless forms. Movement is a natural human response when thoughts or emotions are too overwhelming or cannot be expressed in words. Educators can support movement with the following:

- Help children to become enthusiastic participants in learning dance.
- Warm-up! Even though preschool bodies are much more resilient than adult bodies, they should still be gradually prepared for any vigorous activities.
- Use play with games that require dance movements and cooperation.
- Be aware of cultural norms that may influence children's participation.
- Create environments and routines conducive to movement experiences.
- Consider the space, music, costumes, and props you provide.
- Establish spatial boundaries to ensure children have personal space when engaging in movement and dancing.
- Use children's prior knowledge.
- Structure learning activities so children are active participants.

- Introduce the learning of a dance skill by using imagery.

- Draw on children's interests in dance-making.

- Plan movement activities appropriate for various developmental stages and skill levels.

- Incorporate dances that can be performed without moving the entire body.

- Encourage variety in children's movement.

- Teach rhythm using traditional movement games.

- Use the "echo" as a helpful rhythm exercise.

- Use dance to communicate feelings.

- Use movement to introduce and reinforce concepts from other domains.

- Provide opportunities for unplanned, spontaneous dancing.

Indigenous Perspective

Haudenosaunee dancers move in a counterclockwise (to the left) direction to acknowledge life and the original dance of Skywoman when Turtle Island was created. It is understood that the direction Skywoman danced is why the earth rotates as it does. When the Haudenosaunee dance in the opposite direction, or clockwise, their focus moves from honouring life to honouring death. Children would learn this early in life as they dance with their family members at ceremony or socials.

Table 5.2 Suggested Materials for Movement

Type of Materials	Examples of Materials
Found or Recycled Materials	Boxes, wheels, chairs, hula hoops, balloons, umbrellas, scarves, and other found objects can be used for choreographic variety. Costumes can be assembled from fabrics or donated by families or the community.
Basic	Open rug space; outdoor environment with defined dance space.
Enhanced	Piano, drums, maracas, tambourines, claves, triangles, cymbals, woodblocks, or music system A local dance troupe may donate children's costumes that are no longer used in productions.
Natural Environment	palm leaves, feathers, sand, water, and sticks can be used in movement activities.
Adaptive Materials	If a child has a prosthesis, he or she can decide whether to dance with it on or off. If a child uses a wheelchair, props can be useful to extend what the body can do; a few possibilities are balloons tied to a stick, crepe paper streamers, and scarves.

Figure 3: The joy of movement (Image by Christian Dorn from Pixabay)

5.3 Musicality and Creativity

This section will outline some of the characteristics and key elements of music and play, including a discussion of the innateness of musical creativity and suggestions for encouraging creativity.There is little research on children's musical play or creativity, making it difficult to draw any large conclusions on the topic. What research exists on musical play is based on behaviors from two broad categories of data: 1) observations of younger children's spontaneous musical behaviors in daycare or educational settings designed by adults, or 2) observations of older children in educational settings or outdoors (Marsh and Young, 2006). With a few exceptions, children were not taken seriously as the main subjects or creative agents in studies of musical cultures until Patricia Shehan Campbell's book Songs in their Heads (2005). Campbell, a noted music educator and ethnomusicologist, acknowledged, "Up until a decade ago, the music culture (or cultures) of children had been largely overlooked and under-researched by ethnomusicologists, and had rarely been studied ethnographically by educators" (2005, p. 17-18). The capacity to make music is present in all humans, "and that musicality is as universal as linguistic ability" (Hallam, 2006, p. 104). Each child is born with different strengths and abilities, including diverse types of creative thinking.

What is creativity? Can musical creativity be taught? Are only brilliant people creative? One of the foundational questions regarding any talent or ability is whether it is innate or learned—in other words, are we born musical, or can musicality and creativity be taught? Recent research into creativity has begun to answer some of these questions.As it turns out, creative thinkers do not need to have a high IQ. According to neuroscientists, what makes a creative thinker is the high activity in the association cortices sections of the brain—responsible for making new connections and for "eureka" moments. The more associations, connections, memories, or meanings an individual can make, the more creative the individual (Andreasen, 2006). Measuring creativity often utilizes tasks that reveal divergent thinking versus convergent thinking. A divergent thinker can produce many different answers to a question, while a convergent thinker will produce the one correct answer to a problem. One example might be to think of as many ways as possible to play a musical instrument. There is, of course, one standardized way to play an instrument (convergent thinking), but any instrument can be struck, plucked, banged, or shaken to produce many, many distinct types of sounds.

Gardner's Multiple Intelligences
Another take on creativity and intelligence involves Howard Gardner's Multiple Theories of Intelligence, which posits that intelligences are complex in that they are influenced by a combination of factors such as environment and biology, and that they are educable, capable of being educated or taught (Gardner, 1999). In other words, variations in opportunities and experiences can affect a child's skill-building and therefore impact their intelligences.

Table 5.3 Learning Styles and Approaches

Types of Learners	How They Learn
Visual-spatial	Learn by seeing (graphs, maps, pictures)
Aural	Learn by hearing (oral instructions, music)
Tactile-kinesthetic	Learn by touching (hands-on activities)

Gardner's Theory of Multiple Intelligences (1999) is one of the most significant educational influences of the 20th century and even today. He developed the theory to distinguish between different "modes" of intelligences rather than thinking of intelligence as one unified ability.

Understanding these distinctions can help to guide educators in addressing the different learning needs of children.

Gardner understood that children are innately musical, and that creativity can be nurtured and taught using music as a means of expression not only helps develop the child psychologically and internally as a whole human being, but any musical expression also develops a sense of community and group cohesion.

Musical intelligence is the capacity to discern pitch, rhythm, timbre, and tone. This intelligence enables us

to recognize, create, reproduce, and reflect on music, as demonstrated by composers, conductors, musicians, vocalists, and sensitive listeners. Interestingly, there is often an affective connection between music and the emotions, and musical intelligence may share common thinking processes with mathematical intelligence. Young adults with this kind of intelligence are usually singing or drumming to themselves. They are usually quite aware of sounds others may miss. (Campbell, 2008, p. 3)

Encouraging Musical Creativity

As educators, we can facilitate music making with children and encourage them to explore their musical selves, including their originality, intelligence, and musical capacity. A study by Koutsoupidou and Hargreaves (2009), found that improvisation had significant effects on the development of children's creative musical thinking and that musical originality—the way the child manipulates musical sounds in a unique fashion—increased along with the child's musical flexibility. One of their significant findings reiterates the common-sense idea that "encouraging children to be creative in the classroom can promote creativity while preventing them from engaging in creative activities might inhibit their creative potential" (p. 265-266).

One of the ways of fostering creativity is to encourage improvisation. The term improvisation is often misunderstood to mean, "making something up on the spot." Even the Merriam-Webster definition, which states "to speak or perform without preparation," is highly misleading. In fact, improvisation is an advanced and highly sophisticated skill in which the musician must draw upon all their previously practiced knowledge and techniques to compose "in the moment." Musicians must also respond immediately to their own sound through acute music-listening ability, often coordinating with other musicians around them.

Although there is discussion over whether improvisation skills can be taught, there are some basic steps that allow children a safe, secure context in which to experiment with improvisation. Begin by stressing play and participation over performance. This is critical since most of the self-confidence issues regarding the arts is centered around the idea that children can "get it wrong" or the idea that what they create is less than perfect.

Indigenous Perspective

Sing societies in the Haudenosaunee nations are responsible for learning and performing ceremonial and celebratory songs. They play a critical role in child development because they are responsible for teaching younger generations our songs and their meaning. Children learn how to sing songs or use a rattle or drum by observing the group and would gradually increase their participation as they grow.

Pause to Reflect

Humans of all ages and abilities enjoy music, even in utero. Music can stimulate and calm the brain, helping children to self-regulate.

How do you use and include music in your life?

Important Things to Remember

- When children develop an awareness and knowledge of musical elements, children progress in their understanding and ability to control the elements for personal musical expression.
- Educators should encourage children to be playful and spontaneous when singing.
- Dance is an elemental human experience and a means of expression. It begins before words are formed, and it is innate in children before they use language to communicate.

- Movement is a natural human response when thoughts or emotions are too overwhelming or cannot be expressed in words.
- Howard Gardner understood that children are innately musical, and that creativity can be nurtured and taught using music as a means of expression.

Supplemental Readings

Support Math Readiness Through Music

Encouraging Creativity in Music and Movement Learning Centers

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Visual Arts

6.1 Supporting Visual Arts

Children have a natural fascination with the process of creating visual art. Making marks, squishing clay, and using a brush to apply color are activities that attract most young children. In groups where children speak multiple languages and may not share common words, visual art can create connections and a way of communicating. Art can become a way for people to connect across cultures to their common humanity; an appreciation for it may begin in preschool. Inviting families into the environment to share works of art from the home is an opportunity to build a bridge to the home.

Young children are naturally creative. The visual art framework is designed to encourage creativity; open-ended projects emphasize the process of working with visual materials. In other words, the curriculum is not focused on encouraging a child to produce, for example, a specific painting, but rather to practice using a brush on paper without a set product.

Educators can support the visual arts with the following:

- Encourage engagement with art when working with all age groups, infancy through school age.
- Support exploration and discovery.
- Give children the time and space needed to explore creativity.
- Provide a comfortable environment in which children can practice art.
- Provide opportunities for children to reflect on their own work.
- Respect individual developmental, cultural, and linguistic differences, and encourage children to respect them.
- Provide children simply with a means and place to make marks (e.g., a crayon and paper), and they will begin with the same basic images.
- Encourage communication around shape and form to aid children's drawing skills.
- Help children acquire painting skills through practice with the tools.
- Stimulate children's interest in color and application of paint through other forms of painting.
- Create opportunities for children to work with dough, clay, or wet sand.
- Provide only the malleable material, without tools, during children's initial explorations of sculpting so that children have a chance to explore through touch.
- Communicate to a group of linguistically and culturally diverse children through sculpture techniques by using nonverbal methods.
- Introduce tools after observing that children have had many "hands-on" opportunities to explore clay and dough sculpture.

Figure 1: Exploring with clay (Pxfuel)

6.2 Suggested Materials for Visual Arts

Table 6.1 Suggested Materials for Visual Arts

Type of Materials	Examples of Materials
Found or Recycled Materials	Old books/magazines for cutting and assemblage, cardboard rolls and boxes, plastic lids and containers, fabrics.
Basic	Tempera paints, construction paper, chunky crayons, tray watercolors.
Enhanced	Tube watercolors and palette; watercolor paper.
Natural Environment	Sticks, rocks, and pinecones for sculpture; clay and natural materials for pressing.
Adaptive Materials	Thicker handles on some materials; easel that can be adjusted to angle and appropriate height.

Figure 2: Toddler Visual Art Experience (Image by Mari Kanezaki from Pixabay)

6.3 Ideas for Visual Arts with School-Age Children

Integrating visual arts into the school-age curriculum is not as daunting as one may think. Visual arts lend themselves to naturalistic, holistic, and authentic learning. Visual arts integration does not mean integrating art for the sake of another subject; but integrating art for the arts' sake to heighten children's overall learning experience (Harris, 2011).

To start, think about the fundamentals of visual arts such as line, shape, and color. To teach the vocabulary words of color, the following terminology is suggested: saturation (the amount of intensity a color displays, either very bright or dim), hues (color used in any design in any pixel), tone/value (the amount of lightness in a color placed along a spectrum of black (no tone) to white (highest tone), shades (shades are created by taking a hue and adding pure black to create a new deeper color), and tints (similar except you add pure white to create a new color) (The Science Behind Design Color Theory, n.d.).

To successfully integrate visual arts, it is important for educators to go outside of their own box to new ideas and new learning; it is important to have "cross-disciplinary thinking, collaborative and intentional works, written reflections, revisions, documentation, exhibitions, and critiques-all of which being crucial towards holistic and authentic learning and instruction" (Harris, 2011, p. 21). Visual arts can be integrated into any subject; however, it requires the educator's efforts for planning, researching, and reflecting (Harris, 2011).

When visual arts are added to the learning process, content learning becomes more tangible, personal, and meaningful. Visual arts allow children to engage in hands-on learning and inquiry-based learning. Visual arts add to children's personal expression and creativity in the learning process. In other words, children are engaged in the learning process for deeper levels of learning when visual arts are integrated.

There are many activities that can help educators get a jumpstart in integrating visual arts in the classroom. Below are a few activity ideas for integrating visual arts in content areas:

Activity 1: Da Vinci's Notebook: the educator shows the images to the children and then the children search images to brainstorm images for thoughts and themes for the Notebook. The educator should make sure the images are age-appropriate before letting children surf the web. This activity can be integrated into any subject area (Koonlaba, 2015).

Activity 2: Paper Sculpture Project. Children create paper sculpture projects. This could be integrated into history, writing, language arts, science, and math (Koonlaba, 2015).

Activity 3: Pop Art. Pop art is always very popular with children. The simple imagery is easy for them to imitate. It also engages in content areas (Koonlaba, 2015).

Activity 4: Class Comic Book. Create a class comic book by combining children's art pieces and having them work together to write a story with a beginning, a middle, and an ending (Koonlaba, 2015).

Activity 5: Pyramid Art Project. A Pyramid could be painted/drawn/sketched. This could be used to connect art in math and social studies content areas.

Activity 6: Poster/Brochure/Advertisement Project. Ask children to create a poster, brochure, or advertisement. These art projects can be great alternative assessment products; they are also great tools to teach children about graphic design (Hayes, n.d.).

Activity 7: A Work of Art. Ask children to draw or make a collage about a specific topic they are studying in any content area. Cartoons are great to incorporate visual art with current events in social studies (Hayes, n.d.).

Indigenous Perspectives

Figure: 3 Wampum belts (Image provided by author)

Two Row Wampum

Young children practice stringing beads together which improves hand dexterity in addition to colour recognition, counting, and patterning. This practice introduces children to wampum strings which have been used to relay important messages to other communities. Wampum strings woven together form binding agreements between nations such as the Two Row Wampum shown here. For additional information, see

Pause to Reflect

Adult colouring books are very popular to allow the brain to rest, reduce anxiety and generate mindfulness.

When was the last time you created for your own pleasure? Did you use to enjoy drawing, painting, and creating?

Take a few minutes to doodle- what happens to your thoughts? How do you feel?

Important Things to Remember

- Children have a natural fascination with the process of creating visual art.
- In groups where children speak multiple languages and may not share common words, visual art can create connections and a way of communicating.
- Educators can encourage creativity by providing open-ended projects that emphasize the process of working with visual materials (crayons, paint, brushes, clay, etc.) rather than creating an end product.
- Visual arts allow children to engage in hands-on and inquiry-based learning.

Supplemental Readings

What is Creativity? Explore the Creativity Definition and its Place in Art

Woodworking with Children

Handprint Turkeys Step Aside: Embracing Process Art in Early Childhood Programs

Recycled Art Materials

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Blocks

"Creative materials are, by definition, open-ended, divergent, abstract in design, freeform, and responsive to one's actions on them – all characteristics that ensure that unit blocks are a most treasured type of creative play material" (Shipley, 2012, pg. 377)

Blocks have been recognized as valuable play materials since Friedrich Froebel (1782-1852) incorporated them into his kindergartens. Blocks provide opportunities for development in all domains for all ages of children. As a play material, they are particularly dynamic and responsive to the actions of the child.

7.1 Types of Blocks

Carolyn Pratt (1867-1954) is credited with creating the unit block system made up of solid wooden blocks. Unit blocks are standard proportions to promote mathematical concepts. A complete set of unit blocks (750 pieces) includes the following shapes:

Table 1: Unit Block System

Unit (14 cm x 7 cm x 3.5 cm)	Ramp
Square (½ unit)	Small column
Double unit	Large column
Quadruple unit	Half arch
Ellipse	Small buttress
Curve	Large buttress (flat edge)
Quarter circle	Large buttress (curved edge)
Gothic door	Arch
Large switch	Half circle
Small switch	Roof board
Switch or intersection	Pillar
Small triangle	Half pillar
Large triangle	

Other types of blocks include hollow wooden blocks, smaller tabletop building blocks, foam rubber blocks, and cloth blocks, blocks made of more lightweight cardboard, and Cuisenaire Rods.

Duplo, Mega Blocks, and Lego are often considered to be blocks, but they are distinct from traditional blocks because they have an interlocking mechanism to hold them together. The basic interlocking bricks of these products have some open-ended play value. However, the more complex sets of Lego that must be put together in a specific way to create a finished product are of limited value when the goal is to encourage creativity, representational thinking, and spatial skills. For these reasons, Lego should not be substituted for other types of blocks that encourage creative expression.

Nor should unit blocks be combined with other play materials. According to Shipley (2012), "The key to play with unit blocks is to encourage children to use the blocks alone and not combine them with other play materials or detailed accessories, such as dump trucks or Fisher-Price items. The abstract nature of the unit blocks contributes to children's ability to hold on to their inner vision and assign meaning to an abstract structure." (Shipley, 2012, pg. 377)

7.2 Stages of Block Play

Carrying: A toddler's first interactions with blocks usually involves just carrying them around or banging two blocks together.

Figure 1: Carrying stage of block play (Image by Stacy Brunner at Flickr)

Stacking: During this stage, toddlers may attempt to stack three to four blocks to create a tower.

Figure 2: Stacking stage of block play (Image by Freepik)

Bridging: Supporting a horizontal block on top of two vertical blocks is called "bridging." Preschoolers are becoming more capable of the complex cognitive processes needed: planning which blocks to use, predicting what might happen, estimating how far apart to place the vertical blocks
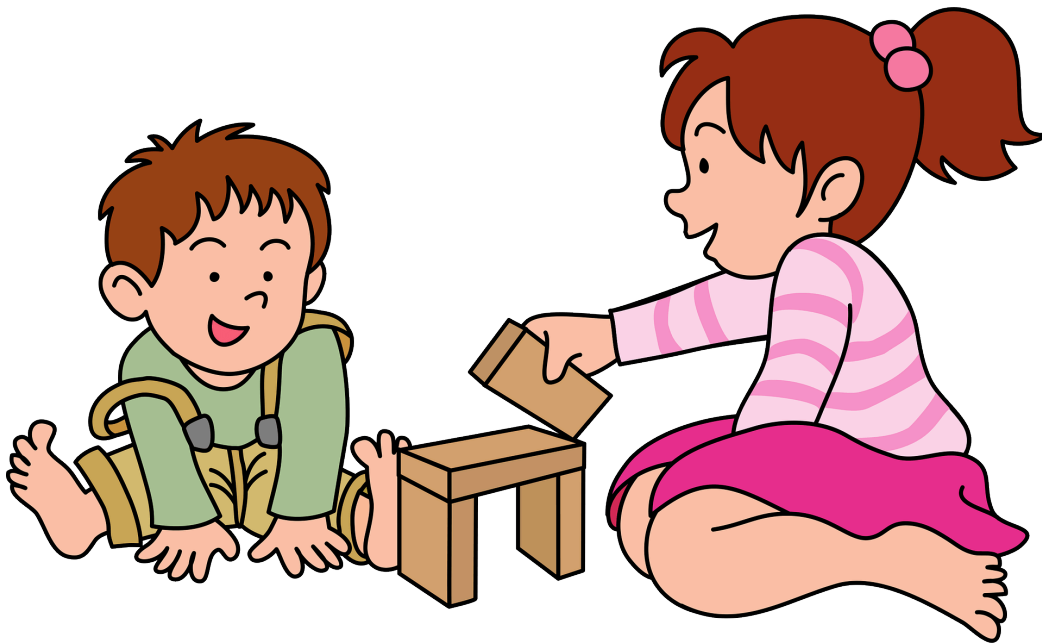
Figure 3: Bridging Stage of block play (Creazilla)

Enclosures: Preschoolers will place blocks so they touch and create a space that is closed off on all sides. Typically, it is not until children are between 5 and 7 years of age that they use additional blocks inside of an enclosure to represent things; for example, furniture in a house or a car in a garage.

Figure 4: Enclosures stage of block play (Image by Woodley Wonders at Flickr)

Patterns: During this stage, block play remains horizontal (that is, on the floor) for the most part. The concept of symmetry is explored by creating elaborate patterns with assorted block shapes.

Figure 5: Patterns stage of block play (Play and Learn Everyday)

Representation 1: Creations become three-dimensional representations of real-world structures. Constructions are named and have a purpose.

Representation 2: Complex constructions such as houses and castles. Children begin to plan what they are going to build, often replicating familiar structures.

Figure 6: Representation stage of block play (Image found on pxfuel)

7.3 Block Play and Math

When children play with blocks they are practicing:

- **Classification** and **seriation** when they select blocks of differing sizes, shapes, and volumes
- **Sorting** similar and dissimilar shapes when tidying up
- **Counting** and **measuring**
- **Estimating** and **predicting**
- **Spatial configurations**

Educators can enhance exposure to mathematical concepts by asking the child questions about:

Size: How many blocks do we need to make the tower as tall as you? Will there be enough room in the garage you are building for all your cars to fit?

Shape: What is the shape of the house you are building? How many sides will it have? These two triangular blocks you put together are the same size as this square block. How come?

Orientation: I see you are trying to fit the blocks together. How do we turn the blocks so they will fit together? How can we connect pieces together to make it so your bridge doesn't fall?

Location: On what side will you build the door to your house

`(Adapted from Expand Mathematical Thinking During Block and Pretend Play)`

7.4 Block Play and Science

Block play provides opportunities to explore a wide variety of scientific concepts and skills.

- **Comparisons**: Which block is smaller? Bigger? Taller? Longest?
- **Gravity**: What will happen if we take this block in the middle away?
- **Balance**: What will happen if we put this large block on top of this smaller block?
- **Weight**: Which block is the heaviest?
- **Observation**: Show me the curved blocks.
- **Estimation**: Which block do you think will fit here?

Adapted from Questions in Block Play Can Support Scientific Learning)

7.5 Block Play and Prosocial Development

Block play is an excellent opportunity to help children learn and build prosocial skills, including:

- **Sharing:** Let's build together.
- **Feelings:** How did you feel when your tower fell over?
- **Taking Turns**: I'll put my block here and then you can put your block on top.
- **Cooperating:** Would you like to build the tower or hand me the blocks?
- **Problem-solving**: How can both of us build using the square blocks?

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(Adapted from Questions in Block Play Can Support Social Skill Development)
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7.6 Block Play and Literacy

Block play is a literacy-rich learning opportunity.

- **Imagination**: Tell me about what you made with your blocks.
- **Letters and print**: Can you use the blocks to spell your name?
- **Same and different**: What is different about these two blocks? What is the same?
- **Listening**: Paige is going to tell us about what she built.
- **New vocabulary**: This shape is called a cube.

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(Adapted from Questions in Block Play Can Increase Your Child's Vocabulary)
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7.7 Block Play and Self-Regulation

Dr. Stuart Shanker (1952 -) defines self-regulation as "the ability to manage your own energy states, emotions, behaviours and attention, in ways that are socially acceptable and help achieve positive goals, such as maintaining good relationships, learning and maintaining wellbeing." (Self-Regulation by Dr. Stuart Shanker). Dr, Shanker makes a key distinction between the concepts of self-control and self-regulation. Self-control is the ability to inhibit impulses whereas self-regulation is the ability to manage stressors. For example, a preschooler may be able to resist the urge to knock over his friend's tower of blocks. This is evidence of self-control. But why did the child feel the urge to knock over his friend's tower of blocks? Perhaps the children playing in the block area were making a lot of noise, which the child found stressful. A child who can recognize environmental factors that cause them stress can respond in a more socially acceptable way by, for example, reducing exposure to the stressor by moving to a quieter area of the room.

7.8 Supporting Block Play

Educators can support block play with the following:

- Ensure the physical environment and the classroom schedule enable uninterrupted play
- Expand on children's planning and problem-solving by asking questions
- Make suggestions when play seems to have stalled
- Comment on structures to show interest
- Protect unfinished structures so a child can return to finish
- Use mathematical and spatial terms to describe structures
- Introduce new vocabulary to describe structures
- Post photos of children's structures
- Pair a child who seems reluctant to engage in block play with a child who enjoys block play
- Encourage respectful relationships (e.g., no hoarding of blocks, no knocking down other structures, etc.)

7.9 Suggested Materials for Block Play

Table 7.2 Suggested Materials for Block Play

Type of Materials	Examples of Materials
Found or Recycled Materials	Boxes and plastic containers of varying shapes and sizes, tin cans.
Basic	Various stores purchased plastic and wooden blocks- lego, duplo, magnetic.
Enhanced	Full set of unit blocks, set of hollow blocks, additional accessories such as PVC tubes, animals, cars, coloured, and liquid-filled blocks. Storage for everyday use.
Natural Environment	Cut and sanded logs and sections. Rocks, shells, planks.
Adaptive Materials	Space is conducive to needs and educators to support- perhaps some blocks on tables and various heights. Baskets to carry blocks easily.

Pause to Reflect

Do you see females accessing the block area regularly? Is there a different way to present blocks so all will benefit from the skills block play offers?

Important Things to Remember

- Blocks provide opportunities for development in all developmental domains for all ages of children.
- The seven stages of block play are: carrying, stacking, bridging, enclosures, patterns, and representation 1 and 2.
- Block play can enhance exposure to mathematical and science concepts.
- Block play is an excellent opportunity to help children learn and build prosocial skills.
- Block play is a literacy-rich learning opportunity.

Supplemental Readings

Using Blocks to Develop 21st Century Skills

Building Bridges to Understanding in the Block Area

The Benefits of Block Play for Infants and Toddlers

Ten Things Children Learn From Block Play

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STEM

8.1 What is STEM?

STEM is an acronym for Science, Technology, Engineering and Math:

- Science – Observing, making connections, coming to conclusions, and asking questions about how things work. For preschool-age children, science-related learning activities might include exploring water and sand, comparing natural materials like rocks and soil, rolling balls across the room, and looking through a magnifying glass to count how many legs are on the bug that was caught during outdoor play.

- Technology – Using tools, identifying problems, and trying different solutions. Technology-related learning activities for preschool-age children might include identifying simple machines like gears, wheels, and pulleys. It may also include simple coding, where children learn how to program little robots to do simple tasks.

- Engineering – Using tools, identifying problems, designing, and creating solutions, and building and inventing things. Engineering activities can happen in the building blocks play area, where preschool-age children plan and design structures every day with little teacher direction.

- Math – Sequencing, measuring, counting, patterning, exploring shapes, comparing size/weight/volume/height/distance. Math-based learning activities in the preschool classroom include counting, matching shapes, and making patterns. Measuring is easy too, especially with unit blocks where children discover that two of the same-sized blocks equal one of the next size up.

Teaching STEM provides opportunities for children of all ages to develop 21st-century skills such as:

- Problem-Solving: STEM learning experiences require children to use critical thinking skills to identify a problem and create solutions.
- Adaptation: The ability to modify a learned concept to fit a different version of an issue or problem.
- Creativity and applying knowledge: STEM allows children to master real-world skills through experimentation and doing. Being able to immediately apply newly gained skills is a strong motivator for learning.
- Decision-making: All four components of STEM can provide opportunities for children to practice assessing options and making decisions based on those assessments.
- Media and Technology Literacy: It is critically important that children embrace the use of technology at an early age so that they are comfortable with innovative technologies they will be exposed to throughout their lives.
- Teamwork: STEM learning experiences lend themselves to working together in groups to identify problems and come up with solutions.
- Risk-taking and experimentation: Learning by experimentation and doing is inherently risky, as the results are initially unknown. Exposure to managed risk-taking allows children to become comfortable with their ability to take risks.
- Social skills: working in groups promotes social skills such as cooperating, negotiating, listening,

following instructions, and turn-taking.

- Communication skills: To be an effective member of a team, children need to be able to communicate their thoughts, ideas, and discoveries to the group.

- Resilience: Learning through experimentation and doing will inevitably expose children to failure. STEM learning experiences teach children that making mistakes is a valuable step in learning.

(Adapted from How to Teach STEM to Preschool Children Through Play)

Unfortunately, it is not uncommon for early childhood educators to feel unprepared to teach science, technology, engineering, and math. They may be afraid of not knowing the right answers to children's questions or providing the wrong answer. Developmentally appropriate STEM activities during the early years focus on developing STEM skills, not STEM knowledge. When viewed through this lens, educators become co-learners rather than the source of knowledge.

> ## Indigenous Perspective
>
> STEM offers a holistic approach to education similar to that of Indigenous perspectives. Children develop skills that are transferable between activities creating a well-rounded adolescent.

8.2 The Educator's Roles and Responsibilities

Educators do not need to have answers to all the questions children will raise. Rather than providing children with answers, the educator can use children's questions as a springboard for further investigations. They may say, "I don't know. Let's find out together." It is essential that educators become learners together with children, model a questioning mind for children and think aloud, expressing interest and enthusiasm. Educators' thoughtful guidance and support through inquiry experiences build a foundation for children's understanding of basic science, technology, engineering, and math concepts, foster a positive approach to learning, and develop learning skills and attitudes necessary for success later in life.

The following principles guide educators in establishing a preschool STEM program that fosters children's curiosity and develops their skills and habits to explore and learn about their world. These principles are consistent with a constructivist approach to learning, where children actively construct knowledge through physical and mental interactions with objects and people in their environment. The principles are drawn from current research-based models and approaches to early childhood education and are consistent with the National Association for the Education of Young Children (NAEYC) guidelines on developmentally appropriate practice.

- The preschool environment supports children's curiosity and encourages inquiry and experimentation.
- The educator
    - acts as a researcher, joining children in exploring their world
    - asks open-ended questions to encourage children to think and talk
    - introduces children to new vocabulary, including scientific, technology, engineering, and math terms such as observe, explore, predict, and measure
    - demonstrates appropriate use of scientific, technology, and engineering tools
    - invites children to reason and draw conclusions
    - encourages children to share their observations and communicate their thoughts
    - models respect for nature
- The content of inquiry is developmentally appropriate and builds on children's prior experiences

- Scientific inquiry experiences are interesting and engaging for children and educators

- Children explore concepts directly through active, hands-on, minds-on playful experiences

- Children explore concepts in depth through multiple, related learning experiences over time

- Children construct knowledge through social interactions with peers and adults

- Children use language and other forms of communication to express their thoughts, describe observations, and document their work

- Science, technology, engineering, and math are embedded in children's daily activities and play and provide a natural vehicle for integrating concepts that cross content areas

- Individual differences are recognized, and all children are included and supported

- To provide culturally appropriate and diverse objects, materials and toys.

- The preschool environment, home, and community are connected through science

> ### Indigenous Perspectives
>
> Reciprocal learning is a key component of everyday life. As life long learners, we recognize that we can learn as much from children as they can learn from us. Often, children provide us with reminders of how to stay connected to the natural world and to appreciate life.

8.3 The Learning Environment

The indoor and outdoor environments provide the context for children's physical and social explorations and construction of STEM concepts. The following are strategies for helping educators set up a physical environment that is rich, stimulating, and conducive to children's construction of knowledge.

- Be thoughtful about what objects and materials to include in the environment.

- Provide a variety of natural materials to observe and investigate.

- Include objects and materials that allow for creativity and open-ended investigation.

- Include living things in the preschool environment.

- Include scientific tools for observation, measurement, and documentation.

- Make scientific tools available throughout the preschool environment.

- Consider adaptations in scientific tools and materials for children with special needs.

- Use technology to support children's scientific experiences.

- Present documentation of science-related experiences in the preschool environment.

- Include children's books with STEM-related content.

- Use the outdoors for natural explorations and investigations.

- Organize the space in ways that promote children's explorations.

- Allow space for observations and for objects, materials, tools, and resources related to science, technology, engineering, and math.

- Allow flexibility in the use of physical space and furniture to accommodate each activity's changing needs.

- To promote self-direction and free exploration, tools, and materials need to be accessible and consistently available to children.

- Social interactions are necessary for conceptual growth and the development of communication skills.

- Always be aware of children's safety.

- Foster children's curiosity and questioning.

- Guide children in exploring their questions.

- Be an active observer.

- Talk with children and engage them in conversations during their investigations.

- Provide children with time.

- Know when to intervene and when to stand back.

- Model and integrate the use of STEM vocabulary.

Pause to Reflect

Taking children on nature walks keeps them grounded and allows us an opportunity to nurture their connection to the natural world. Expressing positive emotions promotes a natural curiosity and appreciation of our cosmological family. Ask questions, encourage their inquisitive nature and foster their imagination to build a life long relationship with the outdoors.

8.4 Science

Children have a sense of wonder and natural curiosity about objects and events in their environment. Just like scientists, they seek information and actively explore and investigate the world around them, try things out to see what happens, and confirm or adjust their expectations.

Science is a natural and developmentally appropriate focus for young children. Preschool science is about active learning, not memorizing scientific facts or watching the educator perform science demonstrations. The purpose of preschool science is to nurture children's habits of inquiry, critical thinking, creativity, innovative problem-solving, open-mindedness, and the motivation to learn. Preschool science guides children's natural curiosity into opportunities to observe, explore, and inquire about basic phenomena and materials in their world.

From infancy, children gain knowledge and develop concepts about living things and physical objects. Preschool science provides children with focused experiences that allow them to learn ways to explore and extend their knowledge. Children begin to adopt scientific ideas and to acquire the basic skills and language of scientific inquiry (ways to explore and develop knowledge and understanding of scientific ideas). Making observations, posing questions, planning investigations, using tools to gather information, making predictions, recording information, and communicating findings and explanations all combine in an evolving process of developing science understanding and creating a disposition to choose to learn science in the future.

Science can be conducted in any preschool setting. All preschools, regardless of the level of resources and access to nature, can use their existing resources to create a program with meaningful science learning experiences. Pushing cars down an incline, building with blocks, manipulating tubes at the water table, or mixing clay with water are everyday play activities that engage children in experimenting with objects and materials. Collecting leaves, searching for insects in the yard, sorting and classifying fruits and vegetables, and sprouting seeds in pots engage children with living things. Experiences of child-initiated play are important as they provide children with opportunities to construct understanding and integrate knowledge. With educators' intentional planning,

guidance, and support, children's play and interactions with objects can become rich experiences of scientific inquiry and facilitate children's knowledge and understanding of objects and events in the world.

Preschool educators play a pivotal role in expanding children's understanding of science concepts and developing children's attitudes, skills, and the language of scientific inquiry. The educator can focus children's attention on science concepts, those that are developmentally appropriate, interesting, and engaging for both children and educators. They can create engaging inquiry experiences, encouraging close observations of objects and events.

Children may draw a connection to their own growth and the growth of other animals and begin to develop a broader understanding of living things. Such experiences of scientific inquiry not only support children's development of scientific knowledge but provide a natural vehicle for developing children's social skills and mathematics, language, literacy, and other domains.

Preschool educators do not need extensive knowledge about science to teach it well, but they should be willing to research and gain a general knowledge of the concepts and principles they explore with children. The kind and amount of information or knowledge they need to know is readily available through basic research. Acquiring some background knowledge about the topic helps teachers in planning inquiry experiences and challenging and supporting children through their explorations.

Figure 1: Exploring science through gardening experiences (pxfuel)

8.5 Technology

Technology-related learning activities can range from investigating how machines like gears, wheels and pulleys work to mastering simple coding. Developmentally appropriate technology activities during the early years are hands-on, with minimal use of screens (e.g., computer, tablet, television, etc.). The National Association for the Education of Young Children (NAEYC) position paper titled "Technology and Interactive Media as Tools in Early Childhood Programs Serving Children from Birth through Age 8" concludes "Technology and interactive media should not replace other beneficial education activities such as creative play, outdoor experiences, and social interactions with peers and adults in early childhood settings. Educators should provide a balance of activities in program for young children, and technology and media should be recognized as tools that are valuable when used

intentionally with children to extend and support active, hands-on, creative, and authentic engagement with those around them and with their world." (pg. 11)

Let's look more closely at coding. Coding is the process of creating the instructions (or "code") that tell a computer, digital toy, robot, etc., what to do. According to the NAEYC, young children need strong higher-order thinking (HOT) skills to find coding engaging and fun.
HOT skills include:

- Analyzing
- Predicting
- Planning
- Patterning
- Sequencing
- Sorting
- Organizing
- Remembering
- Rulemaking
- Breaking down tasks
- Evaluating (The T in STEM: Creating Play-Based Experiences that Support Children's Learning of Coding and Higher Order Thinking)

How can early childhood educators begin to expose young children to technology and strengthen HOT skills without using technology? The NAEYC suggests 5 activities that don't rely on the use of technology.

1. Block Play: Provide a variety of blocks (colour, shape, size) for children to create patterns and sequences. Older children can create more complex patterns that must be analyzed to "decode" a secret message.

2. Reading: Read developmentally appropriate books that provide opportunities for predicting what might happen next in the story and remembering details.

3. Storytelling: Have children work together to write a story that has a beginning, a middle and an end. Have the children create pictures that tell their story and have other children put the pictures in the right sequence.

4. Art: Have the children create a system of directional arrows, stop, and go signs (e.g., a pink arrow means "go right" while a green arrow means "go left").

5. Game Design: Have children draw a map on grid paper for a "robot" (one child) to follow using their directional arrows and symbols. The children will need to count each square so they can tell the "robot" how many "steps" (squares on the grid) to take in each direction; in other words, a "code."

Figure 2: Exploring technology with robots (Photo by Robo Wunderkind on Unsplash)

8.6 Engineering

"While engineering practices—one aspect of STEM learning—are similar to (scientific) inquiry processes, there are some significant differences. Scientific inquiry involves the formulation of a question that can be answered through investigation, while engineering design involves the formulation of a problem that can be solved through design." (Growing in STEM. The Design Process: Engineering Practices in Preschool)

In the early learning environment, engineering is about how things are built and why. These questions are best explored through play.

Example: Water Conservation

"Three-year-olds Jessie and Michaela spend the morning exploring the effects of last night's rainfall on the playground sandbox. After the sun dries the sand, they ask their teacher, Ms. Stefanie, for water to make the sand wet again. Ms. Stefanie frames this as a problem, asking them, "How can we transport water from the porch to the sandbox?" Ms. Stefanie helps a small group of interested preschoolers imagine solutions by providing photographs and nonfiction texts of water transportation systems—like pipes, aqueducts, and pulleys—to introduce them to ways others have addressed similar problems.

For several days, the children investigate potential solutions, realizing that the conservation of water should be one of their primary concerns. As they consider why preserving and reclaiming water matter, they sketch plans and discuss the merits and constraints of various models. Eventually, they agree to design a pipe system to move water. Ms. Stefanie provides copies of a blueprint of the playground, which the children use to draw their pipe

plans. She asks them to think about the materials they need to create a prototype. The children list pipes, water, sand, buckets, tape, clay, twine, and sticks. Their enthusiasm for the project remains high, and Ms. Stefanie looks forward to guiding the children through a few cycles of the design process so they can improve their prototype and build a pipe system."

(Growing in STEM. The Design Process: Engineering Practices in Preschool)

Preschool-age children can begin to explore engineering concepts through a simple design process that includes four steps:

- **Identifying** a problem: Identify a problem or need. Why is it important? How have others approached the problem?
- **Imagining and planning**: Brainstorm solutions. Sketch possible plans. Choose one to build. List and gather needed materials.
- **Creating**: Refer to the plan and build a model or prototype. Share the model for feedback or test the prototype.
- **Improving:** Analyze the model or prototype with others. How could it be improved? Redesign based on feedback.

(Growing in STEM. The Design Process: Engineering Practices in Preschool)

Figure 3: Engineering in Toddlerhood Photo by Ryan Fields on Unsplash)

Indigenous Perspective

Two-Eyed Seeing is a framework created by Mic'maw Elder Albert Marshall and explains the importance of looking at life using both western and Indigenous knowledge equally. It provides a holistic, multi-disciplinary approach to understanding. For more information Two Eyed Seeing.

Pause to Reflect

Using the Water Conservation example, answer the following questions.

1. What problem did the children identify?
2. Why was the problem important to the children?
3. What possible solutions did the children brainstorm?
4. What information did the children need before they were able to build their preferred solution to the problem?
5. What are some questions the educator could ask the children to help them improve their design?

8.7 Math

"Mathematical knowledge begins during infancy and undergoes extensive development over the first 5 years of life. It is just as natural for young children to think mathematically as it is for them to use language, because "humans are born with a fundamental sense of quantity" (Geary, 1994, p. 1), as well as spatial sense, a propensity to search for patterns, and so forth." (Clements, Sarama, & DiBiase, 2004).

Preschool children are active, and early childhood educators must consider this when providing opportunities to explore mathematical concepts through play. Emotionally, preschoolers are inquisitive and explorative. Cognitively, they are in Piaget's preoperational stage of development in which they begin to engage in symbolic play and learn to manipulate symbols. However, Piaget noted that children at this stage do not yet understand concrete logic. Children at this stage learn through pretend play. During the first half of the preoperational stage, children are in the "symbolic function substage." Children at this stage are generally two- to four-years old. They let one object stand in for another and use symbols and signs, such as numbers. They do this through pretend play; therefore, preschool children need as much time as possible for imaginative play. This then leads to the "intuitive thought substage" in which children are not logical but think intuitively. Children at this stage ask many questions and are very curious.

Mathematics is a natural part of the early learning environment. Young children actively construct mathematical knowledge through everyday interactions with their environment, whether inside or outside.

Learning mathematics grows naturally from children's curiosity and enthusiasm to learn and explore their environment. During the preschool years, children continue to show a spontaneous interest in mathematics and further develop their mathematical knowledge and skills related to number, quantity, size, shape, and space. Educators should encourage children's natural enthusiasm and interest in mathematics and use it as a vehicle for supporting the development of children's mathematical concepts and skills.

High-quality mathematics education in preschool is not about elementary arithmetic being pushed down onto younger children. It is broader than mere practice in counting and arithmetic. It is about children experiencing mathematics as they explore ideas of more and less, count objects, make comparisons, create patterns, sort, and measure objects, and explore shapes in space. Mathematics learning happens throughout the day, and it is integrated with learning and developing in other developmental domains such as language and literacy, social-emotional, science, music, and movement. There is a consensus "that high-quality, challenging and accessible mathematics education for three- to six-year-old children is a vital foundation for future mathematics learning."

Educators have a significant role in facilitating children's construction of mathematical concepts. When educators join children in becoming keen observers of their environment and in reasoning about numbers, shapes, and patterns, mathematics is enjoyable and exciting for all.

Educators may not always realize the extent to which their current everyday classroom practices support children's mathematical development. For example, when singing with children "Five Little Ducks Went Out One Day," incorporating finger play with counting, the educator develops children's counting skills and understanding of numbers. Discussing with children how many children came to school today and how many are missing supports children's arithmetic and reasoning with numbers. Playing with children in the sandbox by filling up

different cups with sand and discussing which cup is the smallest or the largest or how many cups of sand it would take to fill up a bucket introduces children to concepts of comparison and measurement.

Young children actively construct mathematical knowledge through everyday interactions with their environment. Setting up a high-quality physical environment is essential for children's mathematical development. The preschool environment sets the stage for children's physical and social exploration and construction of mathematical concepts. It should provide access to objects and materials that encourage children to experiment and learn about key mathematical concepts through everyday play.

Educators can support the exploration of mathematical concepts with the following:

- Enrich the environment with developmentally appropriate, challenging, and engaging materials that promote mathematical growth
- Integrate math-related materials into all interest areas in the classroom
- Use materials, books, and real-life settings that reflect the culture, ways of life, and languages of the children in the group
- Use children's books to explore mathematics with children
- Be intentional and mindful in setting up and using the physical environment (children do not effectively use materials and engage in experiences just because you provide them)

Figure 4: Shape sorter math experience for toddlers (Image from The Kavanaugh Report)
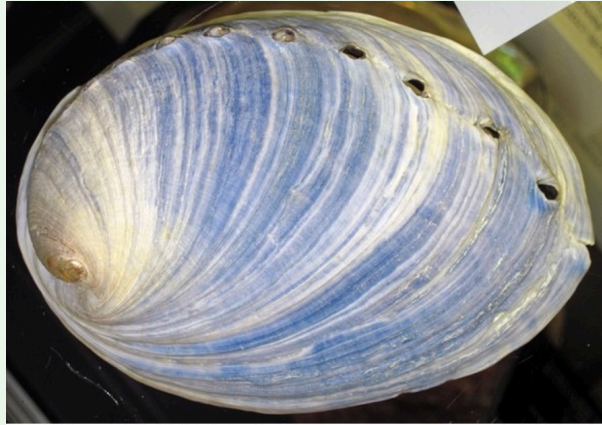
Indigenous Perspective

Figure 5 Quahog Shell (Image provided by author)

Wampum belts have been used by the Haudenosaunne Confederacy since time immemorial as a mnemonic device to relay information, make agreements between Indigneous nations, and for treaty purposes with non-Indigenous nations. They have been traditionally made using the bark of elm trees and beads that were carved from the quahog shells found on the eastern coast. They are now made with prefabricated beads and animal sinew.

Creating a wampum belt provides a multi-disciplinary approach to maths, sciences and the humanities. Watch the video Wampum Belt lesson plan to learn more.

Pause to Reflect

Many adults (including parents and teachers) shy away from math because they "aren't good at it." How do you feel about math? How comfortable are you "teaching" math? Has the way this section presented math affected that at all? If so, how?

Important Things to Remember

- Science, technology, engineering, and math are embedded in children's daily activities and play and provide a natural vehicle for integrating concepts that cross content areas.
- Developmentally appropriate STEM activities during the early years focus on developing STEM skills, not STEM knowledge. When viewed through this lens, educators become co-learners rather than the source of knowledge.
- Educators' thoughtful guidance and support through inquiry experiences build a foundation for children's understanding of basic science, technology, engineering, and math concepts, foster a positive approach to learning, and develop learning skills and attitudes necessary for success later in life.
- Science during the early years is about active learning, not memorizing scientific facts or watching the educator perform science demonstrations. The purpose of science experiences is to nurture children's habits of inquiry, critical thinking, creativity, innovative problem-solving, open-mindedness, and the motivation to learn.
- Developmentally appropriate technology activities during the early years are hands-on, with minimal use of screens.
- Scientific inquiry involves the formulation of a question that can be answered through investigation, while engineering design involves the formulation of a problem that can be solved through design.
- Learning mathematics grows naturally from children's curiosity and enthusiasm to learn and explore their environment. During the early years, children continue to show a spontaneous interest in mathematics and further develop their mathematical knowledge and skills related to numbers, quantity, size, shape, and space.

Supplemental Readings

When teachers think differently about themselves as math learners, students benefit

Make STEM Social to Motivate Preschoolers

Q&A: What the Research Tells Us About Block Play and STEM Learning

The T in STEM: Creating Play-Based Experiences That Support Children's Learning of Coding and Higher Order Thinking

How to Teach STEM to Preschool Children Through Play

Creating Coding Stories and Games

Let's Talk, Read and Sing About STEM: Tips for Preschool Teachers and Providers

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Literacy

Vignette: Prashant's Naan

Four-year-old Prashant pulls a class recipe book from a shelf in the kitchen area that has a couple of recipe boxes, spice jars, and other photo and print-rich recipe books for the children to use. Recently, Prashant shared his family's recipe for making naan, an Indian flatbread, with his class. Today, he uses the class recipe book to begin his play in the daily living center. He carries the recipe book to the stove singing to himself, "Naan, naan, naan." He sifts through the pages of recipes with pictures of his friends enjoying their favorite foods until he finds the recipe he is looking for. On his recipe page, Prashant included a hand drawing of his family eating naan together at home. Pointing to text at the top left he says, "First, I have to put in flour." He pauses reading to dip a measuring cup into a canister with a picture of wheat and the word "flour" taped to the outside. He gestures, dumping two scoops of flour into a bowl on the counter. He returns to the book and reads, "Then, I have to put in the water." Prashant reaches for an empty pitcher and pours water into the bowl. Prashant reads again from the book and adds "yogurt" to the bowl. He picks up a spoon and begins stirring the ingredients in the pot. Then, Prashant scoops the mix into a pan on the stove singing, "Cook, cook, cook."

Prashant pulls naan from the stove top and places the pan on the table. Prashant reaches into a small block basket on the shelf and puts blocks on the tray. Taking the tray to the table he calls out, "Naan for sale, come have a piece of naan!" Desmond, a 4 ½ year old, hears Prashant's invitation and sits down at the table near the kitchen area. Desmond says, "I would like to buy a piece of naan. What kind of naan do you have?"

Miss Elise, the educator who was documenting Prashant's play episode nearby, joins in the play prompting, "Oh, I think your customer might need a menu to help him decide what kind of naan he would like to order." Taking Miss Elise's suggestion, Prashant picks up a clipboard hanging on a hook next to the table and a marker and begins to write three strings of letter-like symbols across the page. As Prashant writes, Desmond says, "I hope he has the butter kind." Prashant hands the clipboard to Desmond and says, "We have garlic and plain naan with butter. What kind would you like?"

Miss Elise moves on to observe other children in the class as the two boys continue to enact Prashant's play episode making naan.

9.1 Constructivism and Literacy Play

Constructivist perspectives recognize children gain important insights into how the world works when they are engaged in rich play experiences. Play supports children's literacy understanding through a process of construction, during which children are acting on the world based on their existing understandings or schemes (Roskos et al., 2010). Framed as a stage theory, constructivist perspectives reason children progressively acquire more sophisticated logic patterns as they interact with their environment. As children develop, they use memory to engage with their environment in increasingly sophisticated ways.

Play opens important spaces for children to practice emerging understandings of the world (Roskos et al., 2010). During play, children use object substitution and meta-play talk to reenact and reimagine observed events from their own lives. Review the following anecdote captured by Elise, the early childhood educator, who observed Prashant making the naan to see how children reenact literate experiences in their pretend play.

Anecdote: Prashant's Naan

Child: Prashant **Location:** Daily Living   **Observer:** Elise **Time:** 9:42 – 9:47am

Prashant carries the recipe book to the stove singing to himself, "Naan, naan, naan." He sifts through the pages of recipes with pictures of his friends enjoying their favorite foods until he finds the recipe he is looking for. On his recipe page, Prashant included a hand drawing of his family eating naan together at home. Pointing to text at the top left he says, "First, I have to put in flour." [...] He picks up a spoon and begins stirring the ingredients in the pot. Then, Prashant scoops the mix into a pan on the stove singing, "Cook, cook, cook." Prashant pulls naan from the stove top and places the pan on the table. He reaches into a small block basket on the shelf and puts several rainbow blocks on a tray. Taking the platter to the table he calls out, "Naan for sale, come have a piece of naan!" [...]

In Prashant's case, both object substitution and meta-play talk promote his exploration of important literacy skills. Renaming objects (e.g., "naan" instead of "blocks") and offering running narrations (e.g., "Naan, naan, naan" and "cook, cook, cook") bring to life pretend play scenarios, making them "real." Using other objects to represent items not readily accessible is considered an important first step toward understanding that letters are symbolic representations of oral language. Similarly, the meta-play talk provides ongoing narration of children's actions and propels storylines forward. Indeed, young children frequently narrate and negotiate their play, even when playing independently. Through their oral narrations, children negotiate literacy-enriched spaces and use environmental tools to represent their understanding of how the world works.

Additionally, in Prashant's Naan play scenario, we see examples of how dramatic play affords children opportunities to explore concepts of sequencing, practice procedural activities, and recognize the text as informative resources. We also see Prashant practicing important language skills such as vocabulary usage, word order, gesturing, and soliciting conversational partners. Prashant strengthens his cognitive skills and practices using his prior knowledge in play. The exact sequence of events for making a naan and the ingredients may be creatively imagined, but it is hard to overlook that Prashant's focused and intentional reenactments mirror common kitchen and literacy practices. Pretend play opportunities reinforce children's current conceptualizations regarding how and why people use language and support their emerging literacy skills.

9.2 Sociocultural Perspectives and Literacy Play

Sociocultural perspectives also recognize innovative play exchanges promote children's emerging literacies. When children play, they use language, gestures, and materials in their environment to sustain play narratives. Play intentions and goals inspire meaningful actions and children embrace flexible representations of objects to drive their play narratives forward (Roskos et al., 2010). For example, Prashant approached his play session with the intention to make bread. He accessed materials to represent real-world items and used language to reenact the preparation process and later sale of the naan.

Play provides a setting for children to use their creative thinking and to communicate their thoughts. Accordingly, sociocultural perspectives encourage educators to consider how children's interactions with objects and more experienced people, including peers, educators, and parents, promote cognitive development (Roskos et al., 2010).

Thought and meaning support children's interactions with playmates and objects to nurture literacy development. Prashant's thoughts on making the naan and the meaning of the item he was producing (it should be made and then shared), supported opportunities for Prashant to interact with his classmates. Vygotskian perspectives consider play "a strong social 'push' from the outside" compelling children to develop more sophisticated interpretations of how their world works (Roskos et al., 2010). It is within complex sociocultural exchanges that children's narrative expressions develop and how changes in children's understandings occur (Nicolopoulou, 2005).

Let's return to the anecdote capturing Prashant's play episode making naan to understand how children's literacy development is also nurtured via their direct interactions with people in their environment.

Anecdote: Prashant's Naan

Child: Prashant and Desmond   **Location:** Daily Living   **Observer:** Elise **Time:** 9:42 – 9:47am

Prashant pulls the naan from the stove top and calls out, "Nan for sale come have a piece of naan!" Desmond hears Prashant's invitation and sits down at the table near the kitchen area. Desmond says, "I would like to buy a piece of naan. What kind of naan do you have?

In this case, Prashant expresses his desire to continue his pretend play narrative by eliciting the support of a peer. Enlisting the play of others in the cooking episode will require the two children to work together to nurture the narrative forward. As their play scenario develops, the children will adhere to specific rules to ensure the meaning of their play is maintained. In this manner, pretend play helps children develop an understanding of different points of view. The educator takes advantage of the shifting storyline negotiated between Prashant and Desmond to draw the children's attention to another kind of text people frequently use in restaurants to help them make decisions, a menu. The educator's casual language prompt provides an intentional literacy scaffold to extend the narrative for the children and supports "meaning-oriented thinking" (Roskos et al., 2010).

Indigenous Perspective

Literacy as it is understood today refers to the ability to read and write. Traditionally, the Haudenosaunee Confederacy and other Indigenous nations depended on oral recitations of important teachings or agreements. This developed strong oration skills, memory skills, and the ability to engage in effective communication. Today, we rely on a combination of oral and written history. The Mohawk language was converted into a standard written form in 1993.

9.3 Ecological Perspectives and Literacy Play

Constructivist perspectives focus on the child's internal mental constructs, and sociocultural perspectives emphasize the interactional exchanges that enhance a child's understanding; however, ecological perspectives highlight the role the environment plays in drawing a child into literacy. Literacy-rich play environments allow children to explore "literate ways of thinking" with their peers and use their emergent literacy skills to influence evolving play scenes (Saracho and Spodek, 2006). Dramatic play opportunities encourage children to recreate life experiences and provide meaningful spaces for children to manipulate literacy materials (e.g., books and writing tools) and grapple with foundational skills that promote children's literacy (Saracho and Spodek, 2006).

In "Prashant's Naan" play scenario, his incorporation of diverse literacy practices (i.e., reading a recipe and creating a menu) is not surprising when we use ecological perspectives to consider the design of this literacy-rich classroom. Both Prashant and Desmond utilized their environment and their understanding of how people interact in different contexts to support their play narrative. We can readily identify the routines (i.e., center time that opened spaces for pretend play and children's existing schemas of restaurant and cooking rules), materials

(i.e., books, cooking utensils and kitchen supplies, paper, and markers) and people (i.e., the children and the educator) that collectively influenced the children's efforts. Educators can positively enhance children's literacy understandings when they intentionally analyze the environment for opportunities that promote children's routine interactions with print-rich materials and language-rich experiences.

As important people in the child's learning environment, early childhood educators should seek opportunities to scaffold children's expressions and enactments during dramatic play experiences (Morrow et al., 2013). In Prashant's play scenario, the educator's decision to encourage children to bring in a recipe, share it with the class, classify the food by category, and add it to a class recipe book throughout the year established an instructional literacy routine that became a natural part of the children's classroom environment. This literacy experience allowed the educator to add an additional print-rich material (i.e., the class recipe book) to the kitchen environment. In this case, the educator recognized the class recipe book would be especially appealing to her learners because it held family and cultural relevance. Experiences like this that strategically blend children's home and school environments further support children's literacy development and illustrate how ecological perspectives can be used to highlight the rich literacy practices already supporting children's understandings in their home environments.

In summary, constructivist, sociocultural, and ecological perspectives invite educators to think strategically about play-filled literacy environments. The perspectives do not need to be considered as competing frameworks, rather each perspective can be used intentionally to consider how we can manipulate the environment to enhance children's experiences using their oral language, reading, and writing skills. In the following section, we focus on principles and practices educators use to intentionally orchestrate literacy-rich classroom environments for children that are developmentally and contextually relevant.

9.4 Literacy-Rich Play Spaces

Literacy-rich play spaces and learning experiences encourage children to explore their understanding of the world. To inspire children's active incorporation of diverse literacy practices in play, educators need to take time to reflect on:

- the amount of time children engage in dramatic and guided play experiences
- the accessibility of intentional materials that inspire creative literacy play opportunities
- the language they use to scaffold children's understandings and support literacy-rich play experiences.

Through their interactions with purposeful materials, educators, and peers, children manipulate and use language in flexible ways to learn about and influence their world. Literacy-rich play areas strategically infuse literacy tools (e.g., books, writing paper, pencils, stamps, envelopes, etc.) and props (e.g., mailboxes, puppet theatres, recipe boxes, lab coats, aprons, etc.) to increase children's incorporation of play scenarios that use their emerging oral language, reading, and writing skills (Wolfersberger et al., 2004). "Literacy Enriched Learning Areas" provides examples of how educators enrich learning areas to intentionally promote children's literacy explorations.
As you review Table 9.4.1, consider how the materials invite children to engage meaningfully in literacy-rich spaces and nurture children's literacy understandings.

Table 9.4.1 Literacy-Enriched Learning Areas

Learning Area	Emergent Literacy Purpose	Examples of Relevant Literacy-Rich Materials
Dramatic Play	• Inspires children's oral language and supports vocabulary development • Invites children to manipulate text in diverse ways • Promotes creative expression	• Themed props to encourage imagination and discovery • Bakery theme: recipe cards, cake boxes, cake pans, spatulas, etc. • Animal shelter: animal name cards, adoption certificates, veterinarian health charts, etc. • Post office: envelopes, mailboxes, stamps, boxes, labels, scales, etc. • Restaurant: menus, note pads, welcome signs, etc. • Writing utensils • Paper
Math	• Encourages children's oral language fluency with mathematical and scientific concepts • Extends children's vocabulary in personally relevant ways • Promotes mathematical literacy • counting, • Cardinality (the total number in a set), • Mathematical operations (adding, subtracting, multiplying, dividing) • Algebraic thinking, • Measurement, • Data collection, and • Geometry (shapes, lines, dimensions, etc.)	• Manipulatives • Counting bears • Snap cubes • Blocks • Cars • Collections of "things" • Paper • Graph paper • Tape measures • Rulers • Writing utensils • Weights
Visual Arts	• Extends children's voices by providing opportunities for children to use multiple mediums to express themselves and represent their ideas • Nurtures creativity • Promotes higher-order thinking skills, including planning, designing, experimenting, and examining • Develops fine motor skills and eye-hand coordination for detailed work with their fingers and hands	• Construction materials (know your learners–safety first as always) • Glue • Tape • String • Staples • Magnets • Hammer and nails • Scissors • Recyclables (boxes, cardboard tubes, cans etc., • Paper of all kinds, sizes, and colors • Natural items (boards, sticks, rocks, slates, etc.) • Paint • Clay • Playdough • Crayons • Markers • Pastels • Pencils • Colored pencils

STEM	- promotes inquiry-based thinking - Encourages children to ask questions about how their physical world works - Supports children's documentation of their thinking and wonderings using words, print, pictures, drawings, diagrams, videos, etc. - Domain-specific vocabulary - Scientific method (e.g., investigation, hypothesis, research, inquiry) - Physical science (e.g., volcano, earthquake, ocean) - Biology (e.g., chrysalis, hive, stem) - Chemistry (e.g., reaction, dissolve, combine) - Technology (e.g., coding, streaming, cloud)	- Natural elements (leaves, shells, snake skins, dirt, water, ice, seeds, etc.) - Physical elements (ramps, marbles, wheels, magnets, pulleys, ropes, etc.) - STEM inquiry tools - Magnifying glasses - Graph Paper - Markers - Tape measures - Rulers - Scales - Science Logs - Measuring Cups

Figure 1: Literacy and Science (Image by Victoria_Watercolor from Pixabay)

Ideas for Integrating Poetry in the Early Years Curriculum

Poetry is a great tool for enhancing literacy in children of all ages. In practice, this will range from rhyming activities with infants and toddlers to reading and writing poetry with preschoolers, kindergarteners, and school-age children. For these older age groups, the educator could also create a poetry billboard for children to share their poems. Children's poetic expressions aren't limited to the classroom. Their observations from authentic learning environments, such as field trips and zoos, provide many wonderful opportunities for them to express their learning poetically and creatively (Shubitz, 2017). Lived experiences from visiting museums, holiday breaks, vacations, or other excursions, can also become the platform for poetry integration to stimulate children's imagination and creativity.

In integrating poetry in the classroom, Schoch (n.d.) suggested using poetry with the following strategies in mind:

- Activate prior knowledge
- Establish theme
- Explore language
- Focus on facts

- Set a scene
- Inspire writing
- See new perspectives
- Ignite curiosity
- Provide pleasure
- Capture character

Poetry is powerful in multiple aspects of learning. Poetry can be used to improve literacy, language arts reading fluency and comprehension, and to promote mathematical reasoning, especially for children who learn linguistically (Martin, 2008; Stange (2008)). Poetry is effective in classroom management, character building, socialization, and learning community (Martin, 2008; Stange, 2008). Poetry plays a pivotal role in the whole-child approach to education.

Poetry lets children see the beauty and power of language; integrating poetry in all content areas engages children in new perspectives, mathematical reasoning, language analytical thinking, and scientific inquiry. Poetry can be integrated as a central thematic element in the classroom to reinforce learning in every content area and to create a positive learning environment where children work cooperatively to express their learning, thoughts, and feelings creatively (Martin, 2008).

Indigenous Perspective

Indigenous children participate in oral storytelling beginning at a very young age. They develop a sophisticated vocabulary because of the focus on oral narration. As a child develops, the story that is shared with them becomes more detailed and intricate allowing them to grow with the story.

Pause to Reflect

Have you heard of story stones? Do a search to find out what they are and how to incorporate in early learning environments.

Important Things to Remember

- Play supports children's literacy understandings through a process of construction, during which children are acting on the world based on their existing understandings or schemes.
- Using other objects to represent items not readily accessible is considered an important first step toward understanding that letters are symbolic representations of oral language.
- Pretend play opportunities reinforce children's current conceptualizations regarding how and why people use language and support their emerging literacy skills.
- Literacy-rich play environments allow children to explore "literate ways of thinking" with their peers and use their emergent literacy skills to influence evolving play scenes.
- Literacy-rich play areas include literacy tools and props to increase children's incorporation of play scenarios that use their emerging oral language, reading, and writing skills.

Supplemental Readings

Literacy-Rich Environments

Indigenous languages- Learning and teaching resources

Promoting Indigenous Languages in Early Learning and Child Care

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Active Outdoor Play

10.1 The Benefits of Active Outdoor Play

Research shows that today's young children spend less time outdoors engaging in active play and exploring the natural world (Clements (2004), Ginsberg (2006), Hastie and Howard (2007), The Henry J. Kaiser Family Foundation (2003), Thigpen (2007).

Researchers have identified reasons for this decline, including:

- Adult fears about crime and safety
- Increased use of television, computer games, DVDs, and smartphones and tablets with digital media
- More time spent indoors in structured activities
- Childcare arrangements with limited free time
- Loss of natural habitats

An increasing number of educators, health/mental health professionals, and other child advocates agree that this trend adversely affects young children's health and development. Richard Louv, a child advocacy expert, worries that children are disconnecting from the natural world, a condition he calls "nature deficit disorder" (Louv, 2008). According to his research, nature deficit disorder contributes to a rise in obesity, depression, and attention disorders. As young children "spend less and less of their lives in natural surroundings, their senses narrow, physiologically and psychologically …." (Louv, 2008).

Whether children live in urban, suburban, or rural communities, the outdoor world provides new opportunities to observe, discover, and learn. In an outdoor environment, children's cognitive capacity to appreciate beauty, express themselves creatively, and perceive sensory patterns and variety expands to all new heights (Torquati & Barber, 2005).

> **Pause to Reflect**
>
> Connection to the outdoors is innate. Humans require this connection for holistic health. Challenge your experiences to include a walk through the forest, your local park, or along a river or lake. Take notice of how you feel, how you breathe, and how you connect to the environment around you. What elements can you bring to the early learning outdoor spaces?

10.2 Why outside

Early childhood education research has established the importance of learning through direct experiences (Torquati, J., & Barber, J., 2011). Theorists such as Montessori and Waldorf offer direct educational practices at their centers. The philosophy of the schools of Reggio, Italy and Howard Gardner also understood and expounded upon the complementary nature of science and the aesthetic experience of young children (Edwards et al.,1998) (Gardner,1999).

Outdoor play and exploration benefit children in many ways. Researchers have identified some general positive outcomes (Moore and Marcus, 2008) (White, 2004), including:

- Increased creativity and imagination

- Development of a sense of wonder, which is an essential motivator for lifelong learning
- Increased social interactions between children
- Enhanced opportunities to make decisions, solve problems and collaborate with peers, which also promote language and communication skills
- Improved awareness, reasoning, and observation skills
- Positive effects on children's ability to focus and pay attention

The outdoors offers rich learning opportunities for children of all ages. Whether in outdoor play spaces, backyards, parks, or on front stoops, these opportunities take shape and place through relationships and interactions between caring, supportive adults, and children. Young children take their cues from the significant adults in their lives. They are more likely to respond positively and explore the outdoor environment when adults plan for, model, and support those explorations. Because educators and families play an essential role in connecting children to nature and the outdoors, educators must consider ways to facilitate and strengthen adult engagement with outdoor play and exploration.

Indigenous Perspective

Many Indigenous nations recognize that the land provides a connection for all living beings. While it is critical for people to be outside and on the land, it is particularly important for young children, so they have an opportunity to develop relationships with their kin. Being "grounded" is not a negative concept for Indigenous people, instead, it refers to connecting with the land. Children who spend time outdoors learn how to be present in their surroundings as they interact with nature.

Figure 1: Interacting with nature (Image by Rick Siderfin from Pixabay)

Pause to Reflect

Canada is blessed with a variety of seasons and temperatures. Sometimes going outside can be challenging in the humidity of summer or the cold of winter. In addition to the positive outcomes listed above, why is it good for adults to get outside? Have you been for a walk recently? Why or why not?

10.3 The Importance of Risk

Risk is an important component of outdoor, nature-based play. It would be negligent to both avoid and ignore risk as an element of the outdoor environment. As with the indoor environment, educators need to focus on the real and the significant risks present in the environment. A risk-benefit assessment should be conducted each time a program plans to engage young children in the outdoors (Motion, 2018). The benefits identified previously outline the positive impact outdoor play can have on the developing child; what risks are present?
A sense of risk needs to include:

- Speed

- Height

- Dangerous tools (hammers & saws)

- Dangerous elements (fire & water)

- Rough & tumble plan

- Sense of getting lost

Risk cannot be taught from a textbook as practical experience is needed (Motion, 2018). The need for practical experience with risk and risk assessment is a key reason to include outdoor risky play as a component of college ECE programs and to include opportunities to work with young children in conducting risk assessments. Risk assessment is dynamic; meaning, what is perceived as risky to one person, may not hold the same risk for another. Children and educators need to be taught to trust their own judgement. To engage in a risk assessment, it is important to use a flexible approach, which considers the ages and varying abilities of individual children, as well as the layout and view of the play space. Adults and children engage in constant risk assessment by looking for dangers in the tree canopy (above their head), at the height of their direct line of vision, and on the ground. Conversations with children will help them develop their own risk assessment and provide them with language to talk about their own abilities. Engaging in risky play is not neglect, reckless, or pushing beyond development abilities!
Risk is often correlated to injuries that may result. Small cuts and bruises, which heal quickly, should be anticipated as a normal part of growing up. Moderate injuries are defined as those injuries which result in time off work or school and would require formal reporting to governing bodies. Serious injuries are defined as those that result in long-term effects such as traumatic brain injuries, amputation, or death (Brussoni, 2018). A visit to the hospital is not a criterion for classification as a serious injury. Often, the risk is avoided with the goal of reducing injuries.

Figure 2 Learning to assess risk (Photo by Annie Spratt on Unsplash)

10.4 Loose Parts

Educators can use "loose parts" to enhance outdoor play opportunities for all age groups. The term refers to "easily moved materials that children may use while playing (Dempsey and Strickland). For example, for infants and toddlers, loose parts are toys and materials that are safe, not fixed in place, and can be used in many ways. They are materials that children collect, put together, mix, separate, stack, fill and dump, and line up. Indoor toys, equipment, and materials brought outside are considered loose parts, as are natural materials such as tree cookies, stones, twigs, seedpods, leaves, water, and sand. Other ideas for loose parts include:

- Fabric
- Containers
- Polyvinyl chloride (PVC) pipes
- Sponges
- Wagons
- Small sleds

- Plastic milk crates
- Backpacks
- Wide, sanded boards that are short enough for toddlers to pick up, carry, or drag

Loose parts are important for several reasons. They:

- Encourage children to manipulate the environment and provide opportunities for creativity and problem-solving.
- Provide children with age-appropriate materials. Because these materials can be used in various ways, each age group uses them in different and appropriate ways.
- Add novelty into the outdoor play environment. This is important for cognitively higher levels of play, such as symbolic play.
- Foster a wide variety of play behaviors, such as dumping and filling; lifting, moving, and carrying; and pretend parallel, and cooperative play. (Dempsey and Strickland)

Figure 3: Loose Parts (Photo by Markus Spiske on Unsplash)

10.5 Sand Play and Water Play

Whenever possible, opportunities for exploration with sand and water are best provided outdoors. When these experiences are attempted indoors, safety issues can limit how the children use the materials. For example, a child who is trying to figure out if all the water in a tall narrow jug is going to fit in a small round bowl is probably going to end up spilling. This is valuable information that would be lost if the child were being reminded not to spill any water on the floor because their friends might slip.

Sand play and water play are often referred to as "sensory play" because they stimulate children's senses which, in turn, develops sensory processing abilities in the brain.

Alternatives to sand and water play as sensory experiences are endless, including using food. However, there are differing opinions about using food in sensory bins in early learning settings; for example, uncooked rice or beans. Those who caution against the use of food cite choking hazards, sanitary issues, allergies, and wastefulness.

Figure 4: Sand Play (Image by Arek Socha from Pixabay)

Important Things to Remember

- Researchers have identified that outdoor play and exploration can increase creativity and imagination in young children.
- Young children are more likely to respond positively and explore the outdoor environment when adults plan for, model, and support those explorations.
- What is perceived as risky to one person, may not hold the same risk for another. Children and educators need to be taught to trust their own judgement.
- Conversations with children will help them develop their own risk assessment and provide them with language to talk about their own abilities.
- The term "loose parts" refers to easily moved materials that children may use while playing.
- Loose parts provide opportunities for creativity and problem-solving as well as encourage higher levels of play, such as symbolic play.

Supplemental Readings

Loose Parts: What does this Mean?

Loose Parts 2: Inspiring Play with Infants and Toddlers

Exploring Sand Play

The Importance of Sand and Water Play

50 Non-feed Sensory Bin Fillers

Canadian Public Health Association: Playground Injuries

The Importance of Sensory Play

Should Food Be Used In Preschool Sensory Activities?

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The Educator's Role in Facilitating Play-Based Experiences

11.1 Play-Based Learning

"Registered early childhood educators (RECEs) are knowledgeable about current learning theories and pedagogical and curriculum approaches that are based on inclusion and inquiry and play-based learning." (Standard II: B.2, CECE Code of Ethics and Standards of Practice, 2017).

According to Danniels and Pyle (2018), there are two types of play-based learning: free play, which is child-directed and internally motivated, and guided play, in which some adult involvement extends the learning opportunities within the play. (CECE Practice Note: Play-Based Learning, p.2).

Educators can support play-based learning with the following:

- Interact with children in their play to extend their thinking and learning opportunities.
- Create schedules that allow for uninterrupted and extended periods of play.
- Co-plan future experiences based on observations of children's play.
- Document children's learning play to make learning visible.

11.2 Play-Based Learning and Pedagogical Practice

In Ontario, the College of Early Childhood Educator's Practice Guideline: Pedagogical Practice (2020) identifies three core elements of pedagogical practice:

- Child-centered, inquiry and play-based learning
- Responsive relationships
- Collaborate inquiry and critical reflection

The Practice Guideline goes on to elaborate on the importance of play and inquiry. "By actively listening to children's ideas and interpretations and incorporating their contributions into the curriculum you show children that they are capable contributors, their interests and questions are important, they are researchers and designers of their pathways to learning and they are valued." (Practice Guideline: Pedagogical Practice, pg. 8)

11.3 The Educator's Role in Supporting the Active Construction of Knowledge

Educators play a pivotal role in children's active construction of knowledge. They intentionally provide the environments and experiences that support children in actively building concepts and skills. The role of the educator who works with young children birth to age five is to support children's active construction of knowledge. In a sense, early childhood educators serve as research supports as the children sense, discover, and construct meaning about the world around them. Young children's natural impulse to learn by investigating (1) what things are like and what they can make them do, and (2) how people create and share meaning shapes the role of the

early childhood educator. The early childhood educator is responsible for: offering children well-stocked play spaces where they can construct concepts and ideas, preferably in the company of friendly peers; designing daily routines that invite children to be active participants and to use emerging skills and concepts; supporting children's learning through interactions and conversations that prompt using language and ideas in new ways and that promote sharing meaning with others.

In carrying out those responsibilities, educators create contexts in which young children can:

- Wonder about what things are like and what they do.
- Investigate a variety of ways of relating one thing to another.
- Invent problems and solutions with others; construct, transform, and represent with the materials at hand.
- Create and share meaning and collaborate in learning.
- Try new challenges and practice emerging skills.
- Express their emotions, feel secure to explore, and regulate their emotions and behavior.
- Manage conflicts in ways that support the development of social skills by:
  - Advocating for one's own needs, safety, and feelings.
  - Learning how to connect with their peers in mutually beneficial ways.
  - Learning how to walk away or disengage from their peers when they feel the need to.
  - Learning how to cope with feelings of rejection or exclusion. And in turn, learning how to seek out positive relationships, rather than dwelling on unsatisfying ones.

Indigenous Perspective

Figure 1 Generations of Indigenous people (Image provided by author)

Indigenous people recognize that they have a responsibility to pass on knowledge from their ancestors to the next seven generations of children. This understanding encourages a sense of relationality by connecting the past to the present and future generations.

Early childhood educators see and support children as scientists and thus design the play environment to serve the children's inquisitive minds. Educators also provide the materials children need to construct concepts and ideas and achieve skills in the natural context of play.

Children learn from opportunities to discover materials that they may be seeing for the first time and need time

to explore and get to know the properties of these materials. It means offering children materials that they can organize into relationships of size, shape, number, function, and time. Children can investigate what happens when they put these materials together or arrange them in new ways, experiencing the delight of discovering possibilities for building with them, transforming them, or using them to represent an experience.

Early childhood educators also design daily routines as rich opportunities for children to participate actively and to use their emerging skills and ideas in meaningful situations. Equally important are the ways in which educators use interactions and conversations with children to support learning. Many interactions occur spontaneously, with the educator being responsive to an interest or need that a child expresses. Many other interactions focus on co-creating or co-constructing meaning as the educator and a child or small group of children focus on a specific topic or activity.

Some interactions may include providing guidance to help children learn to regulate their emotions and behavior or may involve an intervention in which the educator helps children explore how to negotiate a solution to a conflict.

Other interactions and conversations teachers have with children are more predictable. Educators anticipate and organize some interactions and conversations as group discussions, to prompt children's thinking and understanding. Sometimes these groups are small, and sometimes, at preschool age, they are somewhat larger. Educators also guide some activities in a context that allows children to encounter new information and build skills. All interactions are embedded in contexts in which the children are actively engaged in exploring their own developing skills, learning from each other, and acquiring knowledge.

While play occurs naturally, educators must consider the following responsibilities when facilitating appropriate and purposeful play:

Spaces

- Are safe places to explore
- Reflect the mission and core values of the program
- Include culturally sensitive materials to explore
- Include open-ended materials for multi-use

Routines

- Are consistent and predictable
- Provide ample time for unstructured play to occur (Recommendation is 45 minutes minimum). If children aren't provided enough time to become immersed in play, they will be less likely to engage enough to receive the benefit of the activity.

Interactions

- Stimulate creativity by asking open-ended questions or reflective observations
- Respect individual differences in play and interactions
- Encourage cooperation

Educators who are deliberate and purposeful in what they do:

- Promote children's learning through worthwhile and challenging experiences and interactions which foster high-level thinking
- Seize opportunities during experiences and conversations to extend children's thinking and learning
- Model and demonstrate active listening skills
- Utilize varied communication strategies, such as open questions, explanations, speculation and problem-solving

- Move flexibly in and out of various roles and draw on different strategies as the context changes
- Draw on contemporary theories and research for their knowledge and practices
- Monitor children's well-being, life skills, and citizenship, and use the information to guide program planning
- Monitor children's needs and interests and incorporate them into program planning
- Identify 'teachable moments' as they arise and use them to scaffold children's learning and development.

Figure 2: Extending children's learning through conversation (Photo by Yan Krukau on Pexels)

Pause to Reflect

As educators, it is always good to reflect on your own childhood.

- What were your favorite play spaces as a child?
- What did you enjoy doing?
- How might you incorporate some of your childhood play ideas into your setting?
- What role did the adults play when you were a child?
- What are your beliefs about play?
- How do you think play might have changed over the past forty years?
- What impact do you think this might have on children and the adults of the future?

Important Things to Remember

- Free play is child-directed and internally motivated.
- Guided play includes adult involvement to extend the learning opportunities within the play.
- In Ontario, the College of Early Childhood Educators emphasizes that early childhood pedagogy should be child-centered, inquiry-based, and play-based.
- Young children's natural impulse is to learn by investigating what things are like and what they can make them do.
- The early childhood educator is responsible for offering children well-stocked play spaces where they can construct concepts and ideas, preferably in the company of friendly peers; designing daily routines that invite children to be active participants and to use emerging skills and concepts; supporting children's learning through interactions and conversations that prompt using language and ideas in new ways and that promote sharing meaning with others.
- Many learning opportunities occur spontaneously when the educator responds to an interest or need that a child expresses.

Supplemental Readings

CECE Practice Guideline: Pedagogical Practice

CECE Practice Note: Play-Based Learning

Follow the Leader: Child-led Play

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