



Nature and
Young Children

Encouraging *Creative Play* and Learning in Natural Environments

A **David Fulton** Book

Ruth Wilson

Nature and Young Children

What can I do to add richness and variety to play and learning opportunities for young children? Will I have to redesign the playground?

This highly accessible text will provide early years practitioners with a wealth of ideas on how to foster creative play and learning in the outdoor environment with a focus on interacting with the natural world. Included in this text are many simple ideas on the type of materials that can be added to encourage observation, exploration, and dramatic play, as well as guidance on what early years practitioners can do to help children meet early development and academic goals through outdoor learning activities.

Relating to everyday early years settings throughout, the author of this inspirational text addresses topics such as:

- Gardening with young children
- Choosing plants for safety, variety, and active learning
- Making outdoor activities and play spaces accessible for children with disabilities
- Involving parents in appreciating and developing the outdoor space and outdoor activities
- Dealing with fears, safety, and comfort issues.

Providing positive experiences with the natural environment is presented in an effective way to foster child growth and learning and for developing environmentally responsible attitudes, values, and behaviors. This book is recommended for all early years practitioners and students.

Ruth Wilson has been involved in environmental education for over fifteen years and currently teaches at Bellevue Community College, Washington, USA. She is the author of several books, including *Special Educational Needs in the Early Years* (Routledge).

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For children and the earth

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Preface

Those who contemplate the beauty of the earth find reserves of strength that will endure as long as life lasts.

(Rachel Carson)

Play – it’s natural for young children. We see children engaging in play almost from the moment of birth. They play with their hands; they play with sounds; and they play with almost anything anywhere.

Animals and adult humans engage in play, as well. Play has the unique quality of adding joy to our lives. At times, we engage in play to express our joy. For many animals, play allows youngsters to practice hunting and other survival skills. For them, play serves a critical role in developing mastery in such skills as running, balancing, and reading the environment for signs of danger and sources of food.

Children play because that is what they are naturally inclined to do, but play for them is a lot more than filling time. Play helps prepare children for what they may do and experience later in life – for example, what roles they might assume as adults in a family and community (parent, teacher, dancer, fire fighter, etc.).

For children, play serves a multitude of developmental functions, as well – physically, socially, cognitively, and emotionally. Play provides motivation and practice in each of these areas. When given the opportunity to play freely, children will test their limits physically – how high can they climb; how much weight can they lift; how far can they throw; how fast can they run. They’ll also be testing their courage and building their self-esteem. Socially, they’ll practice cooperation and sharing, leading and negotiating, making friends and standing up for one’s self. Cognitively, play helps children develop in the areas of creativity, logic, and problem-solving. It helps them explore, experiment, and discover. Play also contributes to children’s emotional development. As they experience joy, togetherness, and accomplishments, they develop a positive sense of self and a zest for living in an ever-changing and challenging world.

Some adults, aware of the value of play to child development and learning, have a tendency to organize and plan play sessions for children. Adults set the agendas and direct the activities. They often introduce “games with rules” (board games, bowling, Simon Says, tag, etc.) and provide materials that are designed to be used in a narrowly specified way (puzzles, bingo, matching games, etc.). While such activities and materials have a place in child development, they should not be used instead of creative play. In creative play, children set the agenda (or play around with no agenda) and choose their own materials. They set their own rules (or decide there are no rules) and use open-ended materials (materials that can be used in a wide variety of ways).

The emphasis of this book is on creative play – the type of play that is so engaging and valuable for children but troublesome for some adults. Adults may feel that children are just wasting time during creative play. After all, what could they be learning by filling a bucket with sand, pouring it out, and refilling it again – especially if they do this over and over again? As will become evident through the discussions in this book, children can be learning a lot by just “messing around” with simple materials.

This book is about creative play in an outdoor environment. Making an argument for the out-of-doors as a natural place for children to play was unnecessary for most adults of previous generations. The outdoors was “the place” to play. When children became restless indoors or were “under foot” as parents tried to get some work done, children were often told to “go outside and play.” And children needed little coaxing. There was so much to do in the out-of-doors – explore creek beds, watch (or chase) butterflies and lightning bugs, build dens in the woods, load stones in a bucket, and “plant a garden” of twigs. This type of play was freely chosen, engaged the senses, involved problem-solving and imagination, and motivated children to take risks. This is the type of play that will be encouraged throughout this book and will be referred to as “creative play.”

While creative play can and does occur in almost any environment, recent research indicates that natural outdoor spaces have a special quality that promotes the frequency, duration, and quality of creative play (Louv, 2006). Natural outdoor playspaces are spaces that have trees, grass, and other types of vegetation. They also feature a variety of natural materials for children to manipulate.

Creative play in natural environments is encouraged for the benefits it offers to children and to the natural world. Some of the benefits to children have already been discussed in relation to developmental outcomes. For the natural world, the benefits include the development of deeper understandings and appreciation of nature. These understandings and values lead to care and protection of the natural world.

This book is designed to promote the healthy development of children and an ethic of caring for the environment. While some may think that a more efficient way of promoting an environmental ethic would be through direct



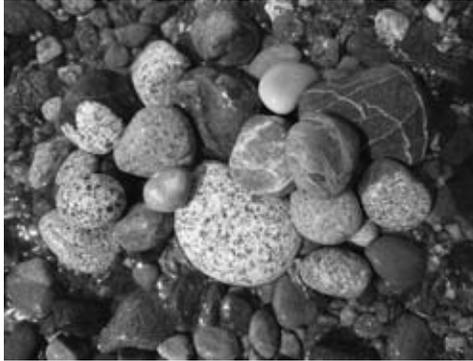
teaching, research and theory in the fields of early childhood education and environmental education do not support the direct-teaching approach (Chawla and Hart, 1995).

From the early childhood education literature, we know that young children construct their own knowledge and build a sense of “rightness” and responsibility from the inside out – versus having knowledge and ethics handed to them from the outside. And from the environmental education literature, we know that environmental stewardship is rooted in a sense of appreciation and caring. Fear and mandates have not been effective in developing strong commitments to protecting the environment. Early positive experiences in natural environments have proven to be a far more effective way of fostering environmental stewardship (Chawla and Hart, 1995). Thus, the ideas for creative play presented in this book focus on outdoor playspaces that give young children a variety of rich opportunities to interact with the natural world.

Chapter 1 presents arguments from research and theory as to why children need time in the out-of-doors and opportunities to interact with the natural environment. The discussion explains how interactions with nature benefit young children in all areas of development (physical, emotional, cognitive, social, aesthetic, etc.) while also promoting a positive environmental ethic. The ideas of creative play and a sense of wonder are also discussed.

Chapter 2 presents ideas and guidelines for designing natural outdoor playspaces for young children. Design considerations include attention to desired outcomes and the quality of children’s experiences while engaged in outdoor play. Related topics focus on the value of outdoor learning centers, a variety of play zones, and the availability of loose parts. This chapter also includes design criteria for environmental yards and a checklist for evaluating outdoor environments for young children.

The role of the adult in making outdoor play creative and meaningful for young children is discussed in Chapter 3. The focus is on how adults can support children’s play and learning activities in a non-instructive and non-intrusive way. Specific guidelines and suggestions are provided as to what



to do and what not to do in promoting a variety of learning activities in the out-of-doors.

Chapter 4 is divided into two major sections. One section is devoted to skills and activities relating to the developmental domains (adaptive, aesthetic, cognitive, social, emotional, and physical). The second section addresses the importance of wonder, creativity, and imagination to the holistic development of children. The discussion within each section presents ideas on how interacting with the natural environment can foster development and learning.

Chapter 5 is divided into four main sections, with each section focusing on a different academic area (literacy, math, science, and social studies). Discussion in each section includes ideas on how interacting with the natural environment can foster a particular area of academics. Also presented are specific play and learning activities that can be done in the out-of-doors to help children develop academic skills.

Chapter 6 addresses some special considerations that teachers, parents, and other adults may have about young children in the out-of-doors. These considerations include (1) safety, (2) fears, and (3) accessibility for all children, including children with disabilities. Specific examples on how to address these issues are presented.

There are two appendices – one describing a few exceptional children’s gardens and the other presenting selected resources. A list of references and a topical index are also provided.

Many aspects of society today (computers, TV, crime, the preponderance of cars, etc.) separate children from nature and suggest that “nature is something to watch, to consume, to wear – to ignore” (Louv, 2006, p. 2). Adults who care about children and the natural environment are called upon to consciously and thoughtfully find ways to bring nature back into children’s lives. Unless we do this, children will miss out on a critical aspect of childhood. Ultimately, separation from the natural world will also diminish the richness of the human experience. Let’s not allow this to be the fate of our children; let’s give them natural places to play, to wonder, and to experience joy.

Children, creative play, and the natural environment

There was a time when the world was a song, and the song was exciting.
(*Les Misérables*)

Children and childhood

A child, as defined by the dictionary (*The American Heritage*, fourth edition), is “a person between birth and puberty; an immature person.” Anyone who actually spends time with children realizes that this definition of a child is fundamentally shallow and incomplete.

Children are busy people. They like to touch, taste, poke, dig, tear, shake, pull, push, and climb. They’re curious and eager to follow the path of curiosity. They’re observant and imaginative – often seeing patterns, shapes, and possibilities that adults rarely notice. Children are also intense, sensitive, and highly competent.

Many adults overlook the uniqueness of childhood. They accept the dictionary definition of a child and view the years of childhood as a “transition” period – a time devoted to waiting for the child to mature into an adult. Adults with this view believe it’s their job to prepare children for what they will face in the future. Such adults fail to acknowledge the importance of valuing children for who they really are and the years of childhood as a special time in the lives of individuals.

We live in an achievement-oriented society with an intense focus on what should be accomplished for the sake of the future. This orientation – along with the mistaken idea of childhood – leads to the misguided introduction of formal academic instruction at an early age and high-stakes testing soon after children enter school. These well-intentioned initiatives place a great deal of stress on children and compromise their emotional well-being (Crain, 2003). A number of studies indicate that children’s academic and social development is also compromised when subjected to pressures and expectations not appropriate to their age (Bredekamp and Copple, 1997; Elkind, 1987).

Creative play

In addition to love and protection, what young children most need is the time and place to play. It's through play that children learn about themselves and the world around them. It's through play that they develop a sense of competence and make invaluable discoveries about their social, cultural, and physical environments. Most of what children need to learn during their early childhood years cannot be taught. It's discovered through play.

Some adults, however, view play as having little value. They're concerned when children spend too much time "just playing." They may view pretend play as cute or charming, but not as educationally serious as learning to read and write. Adults sometimes wonder: "Aren't children just wasting their time when engaged in pretend play? Shouldn't they be learning about the 'real' versus 'imaginary' world?" The answer is a resounding NO!

The imaginary world of children helps them learn many critical concepts about the world that we call "real." An essential concept embedded in pretend play is the understanding that one thing can represent something else. A stick can be a magic wand; small stones can be bird eggs; and the children, themselves, can be veterinarians or wildlife photographers. At first glance, this may not seem significant. Yet, the underlying concepts behind such essential skills as reading, writing, drawing, map making, understanding and expressing ideas, and planning for the future involve our ability to make something stand for (or represent) something else. This ability – so readily developed through creative play – is crucial for later academic success. Children who can readily manipulate symbols in dramatic play are more likely to accept and use the symbols associated with mathematics, reading, and writing (Bilton, 2002).

We can't teach the concept of representation – children need to discover and experiment with it on their own. Creative play is the appropriate medium for developing this understanding during the early childhood years.

Children gain other concepts and skills as they play, as well. They use their senses, explore their environment, solve problems, and then incorporate what they experience into their internal system of thought. Play also promotes children's social and emotional development. As they play, children learn to share, cooperate, take turns, and negotiate. As they play with others, children experience different personalities, temperaments, and ways of doing things, and – in the process – gain valuable insights into themselves and each other. Through role play, children are able to "decenter" – to get into another person's shoes and to see things from another perspective (Bilton, 2002). Both self-concept and self-esteem are fostered through play. Creative play helps children learn about their bodies, their abilities, and their relationships with others. They learn to deal with frustrations, to make decisions, and to challenge themselves in social, cognitive, and physical activities.

Play is an "easy means of learning for young children, as they are naturally drawn to it and want to get involved in it" (Bilton, 2002, p. 116). Because

they find play motivating, children will often exercise great self-control and cooperation with the group so as not to stop or spoil a play situation.

Play helps children grow physically. During play, large muscles are exercised; balance, coordination, and endurance are strengthened; and small muscle skills are refined. Thus, across the developmental domains and in all areas of learning, it's a mistake to think of playing and learning as two different or opposing activities.

The National Association for the Education of Young Children (NAEYC) (Bredenkamp and Copple, 1997) states that children should be given ample opportunities to play because of the many benefits it offers, including:

- Play is an active form of learning that unites the mind, body, and spirit.
- Play reduces the tension that often comes with expectations to achieve.
- Play provides a healthy avenue for expressing and working out emotional aspects of everyday experiences.
- Play helps children develop the ability to see things from another person's point of view.
- Play engages all the senses as powerful modes of learning.
- Play helps children gain competence in moving through the larger world.

It's important for parents and teachers to demonstrate a positive attitude towards imaginative play. Children should never be criticized or discouraged from engaging in creative play. One child pretending to be a dolphin was reprimanded by a teacher for "acting silly." Even if it was time to move on to a different activity (e.g. lunch, dismissal, etc.), the child's play should not have been labeled "silly." A more appropriate response from the teacher might have been: "Dion, you have some interesting ideas about dolphins. Maybe you can show me some more of your ideas tomorrow. Right now, it's time to wash your hands for lunch."

Some parents and teachers make another mistake. They notice what a child is doing during creative play and then try to take over the play scenario. Their intentions are to extend the child's learning – to add more information (facts), more learning outcomes for the child. The adult mistakenly thinks this will increase the richness of the learning episode. There are times when the adult's participation in a child's creative play activity does lead to enhanced learning – but this rarely occurs when the adult takes the directing role away from a child. The adult's attitudes and behaviors should leave the child feeling that he or she is a competent, interesting, and creative individual. Taking over a child-initiated activity does not give children this positive message. While the adult can introduce some props and ideas, the child should be allowed to remain in the role of director – especially for dramatic play and other creative activities.

The United Nations Convention on the Rights of the Child recognizes the right to play as one of the basic rights of children. As stated in Article 31

of the Convention, children have the right “to rest and leisure, to engage in play and recreational activities appropriate to the age of the child.” It is up to adults to protect and support this right for children.

The natural environment

The natural environment is an ideal place for children to engage in creative play. Greenman (2005) relates the following qualities of the natural world to explain why it is so rich in play potential:

- Nature is universal and timeless.
- Nature is unpredictable.
- Nature is bountiful.
- Nature is beautiful.
- Nature is alive with sounds.
- Nature creates a multitude of places.
- Nature is real.
- Nature nourishes and heals.

The United Nations Convention on the Rights of the Child also recognizes the right of children to live and play in an environment that stimulates their healthy development. Natural environments stimulate play, development, and learning in a special boundless way. Nature must, therefore, be seen as an essential component of the children’s environment (Moore and Cosco, 2006). Natural places (beach, woods, streams, etc.) not only stimulate healthy development but also provide the most playful physical environments for young children

While children find ways to play anywhere with almost anything, some environments and materials are more conducive to creative play than others. Studies of children in different types of environments indicate that children engage in more creative forms of play (including fantasy and pretend play) in “green” or “natural” areas than in more traditional playgrounds or “prepared” indoor playspaces (Louv, 2006; Moore and Cosco, 2006).

Bilton’s (2002) summary of research comparing indoor and outdoor play outlines some additional relevant findings. These findings indicate that some children,

- are socially more inhibited when indoors;
- benefit from a higher level of learning when outdoors;
- are more assertive outdoors;
- concentrate longer outdoors; and – not surprisingly –
- prefer to play outdoors.

Findings also indicate that pretend play tends to be the most dominant form of play outside. Bilton (2002, p. 116) explains this by noting that

what the outdoors affords to young children is the opportunity to be in role, to be playing imaginatively, and more than this, it enables them to be involved in fairly large groups. This is not only because there is more space, and noise is more easily dissipated outside, but also because there is a greater sense of freedom in the outdoors.

Connecting children and the natural environment

A number of researchers and child development specialists call for a closer connection between children and the natural world. Their work is based, in large part, on understandings about (1) young children and nature; (2) play in natural environments; and (3) the development of environmental ethics. Presented in Box 1.1 is an outline of related understandings in each of these three areas.

Young children and nature

Unless influenced otherwise, young children are fascinated by the natural world. They're drawn to other living things, especially animals. They reach out to pick flowers, to put their hands in water and sand, and to dig for natural treasures in a mound of dirt. Evidence suggests that children also know and experience the natural world differently to adults (Sebba, 1991; Wilson, 1996a). According to Rachel Carson (1956), the child knows the world as being "fresh and new and beautiful, full of wonder and excitement." As for adults, Carson says: "It is our misfortune that for most of us that clear-eyed vision, that true instinct for what is beautiful and awe-inspiring, is dimmed and even lost before we reach adulthood" (1956, p. 42).

Some people are surprised to learn that Carson wrote about children and nature. They know Rachel Carson primarily as a scientist who ushered in the environmental movement with her research and writings on the dangers of pesticides to the natural world. As a scientist, Carson spent a great deal of time in close, objective observation of the physical world around her. But – as reflected in the above passage – Carson also thought about children and their unique way of experiencing the world. She placed great value on children's way of knowing and the impact of nature as a source of wonder and delight. She advocated frequent opportunities for children to walk in the woods and along the water's edge in all kinds of weather. And she recognized through her excursions with her nephew, Roger, that children – even as young infants – possess an acceptance of a world of "elemental things" and that they find great joy and delight in experiencing and exploring the natural world.

Others who have compared children's experience of the world to that of adults include Rachel Sebba and Joseph Clinton Pearce. According to Sebba (1991), children perceive the world through the gift of "primal seeing." This

Box 1.1 Basic understandings about young children and play in natural environments

1 Young children and nature

- Children are fascinated with the natural world.
- Children have a unique way of knowing the natural world.
- Children who do not have frequent positive experiences with the world of nature are more likely to develop unhealthy stress-related behaviors.

2 Play in natural environments

- Play in natural environments provides far more opportunities for development and learning than playgrounds equipped with exercise equipment only.
- Play in natural environments promotes the holistic development of children as it fosters growth in all of the developmental domains (adaptive, aesthetic, cognitive, communication, sensorimotor, and socioemotional).
- Play in natural environments tends to be more varied, complex, and creative than play in other types of outdoor settings.
- Play in natural environments fosters children's naturalistic intelligence.
- Play in natural environments supports learning on the part of children with all types of learning styles and abilities.
- Children playing in natural environments tend to have fewer accidents and fights than children playing on more traditional playgrounds

3 The development of environmental ethics

- The most effective way to instill a lifelong sense of caring and responsibility for the natural world is to give young children frequent positive experiences with the world of nature.
- Fostering an environmental ethic involves not only learning *about* nature but also learning *through* nature.
- Unless children have frequent positive interactions with the natural world, they are likely to develop unfounded fears and prejudices about nature that impede the development of an environmental ethic.

gift allows them to experience the “magic” or “essence” of the world around them. Pearce (1971) describes children’s way of knowing the world in similar terms. He talks about “magical thinking” and “primary perceptions” during the years of childhood. While this way of knowing or seeing the world differs from the adult’s, it should not be viewed as incorrect or inferior. In fact, it would be well – that is, respectful of children and promoting their holistic development – for parents and other adults to honor and celebrate children’s way of knowing the world and give them ample opportunities for playing and exploring in a natural environment.

Young children not only know the world differently than adults, they also do different things in interacting with nature. The natural world for children is not just a scene or backdrop – it’s something to be interacted with. Young children want to do more than look. They want to touch, dig, poke, shake, pound, pour, smell, taste, and “muck around.” They want to explore and experiment. They want to be busy doing something – and it is through such busyness that they learn about the natural world and about themselves. Both research and theory strongly support the idea of young children “learning through doing” in the form of creative play (Bredenkamp and Copple, 1997).

Many children today are deprived of frequent positive experiences with the natural world. Researchers and child development specialists are beginning to study the causes and consequences of this situation. Richard Louv (2006), in *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*, uses the term, “de-naturing of childhood,” and discusses its extent, possible causes, and impact. He talks about the “criminalization of natural play,” which he views as both a symptom and cause of the move from children living immersed in the natural world to being divorced from that world.

Louv notes that the “de-naturing of childhood” can be attributed to various conditions – some that are cultural or institutional, others that are personal or familial. Cultural and institutional barriers include the growing practice of litigation, trends in education that marginalize direct experience in nature, and the structure of cities. Personal or familial barriers include time pressures and fear. Many parents are caught up in the “waste no time” syndrome. They feel that to get ahead children’s lives should be carefully programmed. Thus, from early on, they enroll their children in such activities as competitive sports, computer camps, and other types of “enrichment activities” (art and music lessons, “early science,” etc.). They also pressure their children to excel in school – with the emphasis on high grades and test scores. “Just playing” in this get-ahead culture, he notes, is considered a waste of valuable time.

When children are given time to play, it’s often in a commercialized or computerized environment. Indoor play centers are becoming increasingly popular – Kids Cafes, video arcades, “water baby” swimming pools, and climbing structures in shopping malls. Even nature centers and zoos are beginning to develop elaborate indoor exhibits and classrooms – some of which include climbing walls, artificial trees, and computer games.

“Entertainment” for children often replaces creative play – for example, TVs and DVD players in children’s bedrooms, computers and entertainment centers in family rooms, frequent outings to movie theaters and organized sports events. While these forms of entertainment may not be harmful in themselves, they erode the time and freedom children have for creative play. And this is a problem, as children need creative play to develop in a holistic way. Creative play can’t be hurried or tightly scheduled between completing homework and getting ready for swim lessons.

Too much time in commercialized and computerized environments not only deprives children of time to play, but it also separates them from nature. This is a problem, as children need nature – not something to study or look at, but to interact with. And as Louv says: “It takes time – loose, unstructured dreamtime – to experience nature in a meaningful way” (2006, p. 117).

Play in natural environments

Young children’s ways of knowing and learning make them excellent candidates for nature exploration. Such explorations foster the child’s health, ability to concentrate, and emotional bonding with the natural world. The natural world offers an incredible wealth of sensory experiences and open-ended materials for motoric manipulation. Experiences in natural outdoor playspaces also tend to be rich in opportunities for nurturing growth in all of the developmental domains, including adaptive, aesthetic, cognitive, communication, sensorimotor, and socioemotional (Wilson, 1995). Information presented in Table 1.1 relates examples of elements and/or experiences in a natural outdoor environment that foster those skills.

Another advantage of play in a natural environment is the lessening of aggressive behaviors and accidents. Children tend to bridge their differences more easily in a natural environment; fights and accidents – so common on asphalt yards – give way to more constructive play (Hines, 2005).

The quality of play also tends to be richer in natural environments. Studies comparing play in green, natural spaces with play in blacktop playgrounds found that play on asphalt was much more interrupted and consisted of short segments. In more natural areas, on the other hand, children were more likely to invent whole sagas that they carried from day to day. Natural schoolyards encouraged more fantasy and make-believe play, and provided ways for boys and girls to play together in egalitarian ways. Children playing in more natural areas also showed a greater sense of wonder (Louv, 2006).

Researchers who have contributed to our understanding of the value of play in natural environments include Edward O. Wilson and Howard Gardner. Wilson (1984), a scientist at Harvard University, suggests that humans have an innate affinity for the natural world. He introduced the term “biophilia” and described it as “the urge to affiliate with other forms of life.” He and his colleagues propose that biophilia is biologically based and integral to our

Table 1.1 Child development and the natural environment

<i>Domain</i>	<i>Description</i>	<i>Examples of related skills</i>	<i>Examples of related elements/experiences in the outdoor environment</i>
Adaptive	Ability to function successfully in one's environment	Maintaining balance while walking over a variety of surfaces and uneven terrain	Grass, gravel, sand, tree roots, inclines
Aesthetic	Being sensitive to beauty in nature and art	Noticing colors, scents, sounds, and textures	Leaves, flowers, bird song, moss, feathers, wind
Cognitive	Mental understandings	Understanding concepts related to size, shape, weight, comparisons, causes and effects	Trees, rocks, eggshells, water, light
Communication	Ability to share ideas, thoughts, and feelings	Describing, asking, responding, telling	Animals, different properties of water, changes in the weather, shapes of clouds in the sky, dens
Sensorimotor	Sensory perception and physical movements	Seeing, hearing, tasting, feeling, crawling, running, carrying, digging, splashing	Bending of branches in the wind, sound of water falling over rocks, freshly picked berries, logs, grass, stones, soil, water
Socioemotional	Interactions with others and sense of self	Problem-solving, sharing, pretending, caring, constructing	Sticks, grasses, leaves, dens, gardens and gardening tools, bird baths and bird feeders

development as individuals. The concept of biophilia suggests that play in natural environments matches an innate need of young children and fosters their holistic development.

Howard Gardner, a professor of education at Harvard University, also recognizes the value of involvement with nature to child development. In the early 1980s, Gardner raised the idea of expanding our traditional understanding of human intelligence. He suggested that results of an IQ test provide far too limited a view of one's intelligence and introduced the idea of multiple intelligences. He originally proposed seven types of intelligence: linguistic,

logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal, and intrapersonal. He has since added the idea of an eighth intelligence – that is, the naturalistic intelligence. The core of this intelligence, he says, is the ability to recognize plants, animals, and other parts of the natural environment. It also deals with sensing patterns in and making connections to elements in the natural world (Gardner, 1999). Gardner suggested that Rachel Carson clearly manifested a naturalistic intelligence.

Psychologists and educators who have studied Gardner's idea of being "nature smart," suggest the following descriptors of children with naturalistic intelligence. They

- display keen sensory skills (sight, sound, smell, taste, and touch);
- readily notice and categorize elements of the natural world;
- enjoy being outdoors and engaging in such nature-related activities as gardening, exploring natural areas, and observing natural phenomena (e.g. movement of clouds, singing of birds, effects of wind and rain, etc.);
- easily notice patterns in their natural surroundings (differences, similarities, linkages, etc.);
- display an interest in and care about animals and plants;
- enjoy collecting nature-related specimens (e.g. leaves, rocks, shells, seeds, etc.);
- express awareness of and concern for the well-being of the natural world;
- easily learn new information about natural objects and species and understand ecological concepts.

According to Gardner's theory, everyone has each type of intelligence to varying degrees, but culture and experience play a role in the development of a particular type of intelligence. Each type of intelligence needs a stimulating physical and social environment to foster that particular area of development. Such stimulating environments provide children with the motivation and opportunity to become skilled in certain areas.

Creative play in natural environments allows the naturalistic intelligence to flourish. The core of learning about the natural environment is not embedded in information provided to a child (knowledge presented from the outside) but in the interaction between the child and the world of nature. This approach to learning is sometimes referred to as environment-based or place-based education and is characterized by direct experiences with nature (Louv, 2006; Sobel, 2004). "The basic idea [of place-based education] is to use the surrounding community, including nature, as the preferred classroom" (Louv, 2006, p. 204). This approach has proven effective – not only in fostering the naturalistic intelligence but also in improving academic performance (Louv, 2006; Sobel, 2004).

Adults can help children develop the naturalistic intelligence by encouraging them to collect natural materials (seeds, stones, leaves, flowers, etc.),



closely observe the different types of plants and animals in their yard and community park, study books and magazines with pictures of plants and animals, and engage in outdoor activities, such as gardening, hiking, climbing, exploring, etc.

The development of environmental ethics

The development of an environmental ethic shouldn't be left to chance, either. Some may ask when is it appropriate to tell children that they have a role in "saving the Earth" – when they are eight years old, six, five, even earlier? This question doesn't come with a simple answer. Parents and early childhood educators often struggle with this and other related issues. They wonder:

- Should we teach young children about endangered species?
- Is it OK to pick wild flowers and catch insects for close-up study?
- Is it safe for children to walk barefoot through the grass?

Many of us want to help children learn about the natural world and feel some urgency in instilling a sense of responsibility for care of the Earth. Yet, we may not be sure about what is appropriate to teach young children and how to go about fostering an environmental ethic.

“Save the Earth” campaigns are not appropriate during the early childhood years. There are a number of reasons why this is so. While the present state of the environment calls for a great deal of concern, it is not a concern that we should place on the shoulders and in the minds of young children. Placing the burden on children is, in essence, asking them to fix something they did not break and assigning them a task that they are not equipped to handle. Using a “Save the Earth” approach with young children can lead to serious oversimplifications of the issues. It can also lead to feelings of fear and helplessness on the part of children. These feelings work against the development of a positive environmental ethic.

Fear is a part of the “de-naturing of childhood.” Too many children are beginning to see nature as our natural enemy. While real dangers do exist in the natural world, the threat is greatly exaggerated (Louv, 2006). In fact, many indoor environments are more dangerous to children’s health than most outdoor environments. Health-related issues with indoor environments include air pollution, toxic molds, carbon monoxide, radon, lead dust, spread of infectious diseases, toxic cleaning chemicals, hot surfaces, bathtub drownings, child neglect and abuse, choking dangers, falls, etc. A critical review of these health and safety issues gives cause for reconsidering the relative dangers of indoor and outdoor environments.

Fear of the natural environment gets in the way of positive interactions with nature. While there are some things in nature for which we have reason to fear (poisonous snakes and spiders, for example), we tend to have unfounded fears of and hold prejudices against other parts of the natural world that pose no threats to our safety. Such fears and prejudices may develop in response to cultural messages about the environment.

Some Native American cultures refer to plants and animals as their sisters and brothers. These terms emphasize the positive link between people and other living things. More popular terms used in the dominant culture, however, include “pests,” “varmints,” and “weeds.” We use “bug bombs” and “killer sprays” to rid ourselves of their presence. We read stories about the “big bad wolf” and tell children to stay away from the woods and the water. Our directives to children include:

- “Don’t dig in the dirt. It’s messy.”
- “Don’t play in the weeds. You might get hurt.”
- “Don’t touch that shell. It looks slimy.”
- “Don’t go outdoors – it’s too cold, or too wet, or too hot, and it will make you sick.”

If we don’t give these messages in words, we may be giving them through our actions. Consider the following:

- Most people spend at least 95% of their time indoors.

- Virtual pets – that can be given food, medicine, discipline, and love – are on the market as an alternative to dealing with live animals.
- Some visitors to national forests have suggested spraying the wilderness areas to get rid of insects and other pests.
- People on vacation tend to spend far more time shopping than exploring or enjoying natural areas.
- The Disneyworld theme park in Florida is the most popular adult vacation destination in the world (Serjeant, 2006).

Such messages, attitudes, and behaviors contribute to a serious “psychological detachment” from nature (Slade, 1991). They also contribute to a fear of nature. Bixler and his colleagues (Bixler *et al.*, 1994) found fear to be a major deterrent to positive outcomes for urban school children visiting a natural area (a city park). They found that children are often fearful and anxious, and have no idea of what to expect when visiting a natural area. In addition to having a general fear of being in the woods, these children also feared snakes, insects, and spiders. Their list of what they feared included small native mammals (such as squirrels, chipmunks, and rabbits), as well.

Another study (Wilson, 1994a) focused on the nature-related thoughts and feelings of younger children (ages three through five). In this study, children in a one-on-one setting, were asked a set of questions, some paired with pictures of natural settings and/or wildlife. One picture portrayed three baby birds in a nest, with the mother bird feeding them a worm. The children were asked, “What would you do if you were close to these birds?” Responses included more expressions of violence, such as “kill them,” “cut their mouths off,” “slap ‘em,” and “kick them” than expressions of care, wonder, or interest. Similar expressions of violence were given when a picture of a monarch butterfly was shown. While what young children say and what they would actually do may not be the same, the expressions of violence are cause for concern. The one-on-one setting suggests that the children weren’t copying what someone else had said nor trying to impress their peers with outrageous ideas. Their statements were made in a serious, matter-of-fact way.

We can’t know with certainty what motivated these expressions of violence. Were the children’s statements reflecting the violence they see in the media, or might the expressions of violence be based on fear? One typical response to fear is to fight – “I’ll hurt it before it hurts me.” But why would children fear baby birds and butterflies? The likely answer is their lack of familiarity with other living things. How many young children have had the opportunity to quietly observe birds and butterflies over time? Children who have little contact with animals in natural environments tend to become fearful of what they don’t know.

So what happens when children are deprived of positive experiences in the natural world – when their lives are encased in environments devoid of the complexity of nature? According to Louv (2006), Nabhan and Trimble

(1994), and others, the “de-naturing of childhood” leads to some very troubling results including:

- diminished use of the senses;
- attention difficulties;
- higher rates of physical and emotional illnesses; and
- the development of unfounded fears of the natural world.

What does this suggest in terms of teaching environmental education at the early childhood level. Should it be done? The answer is a definite “yes” and the reasons for doing so include considerable benefits for both children and the Earth.

Someone has said that “teaching a child not to step on a caterpillar is as important to the child as it is to the caterpillar.” This sentiment addresses the developmental benefits of respect for the natural world and a sense of connectedness to it. Environmental psychologists, including Louise Chawla (1990), tell us that positive interactions with the natural environment are important for healthy child development – that children need nature to grow in healthy and holistic ways. They especially need the natural world for some of the “soul-making” aspects of human development, including the appreciation of beauty, mystery, and wonder (Wilson, 1996b).

While some have referred to this world as a “vale of tears” – a place where we must struggle, work, and suffer – the poet, John Keats, suggested that we live in a “Vale of Soul-making” – a place that breathes life and a sense of wonder into our beings. Referring to the Earth as “the birthplace of our spirit” – as is sometimes done – is consistent with Keats’ sentiment.

Young children seem to be especially responsive to the soul-making aspects of contact with nature. We often see that as young children interact with the world of nature, they experience a sense of wonder, joy, and awe. Nature touches their spirit in deep and profound ways. For young children, nature is seldom just a scene or landscape. They experience it with sheer sensory delight. By helping young children know and relate to the soul-making aspects of the natural world, we connect them to enduring sources of strength, wonder, and joy (Carson, 1956). Once children learn to love and respect the Earth, they are likely to care deeply about its well-being. This is the essence of an environmental ethic.

Biophobia (an aversion to nature) is the opposite of biophilia and tends to develop if children’s natural attraction for nature is not encouraged or given opportunities to flourish during the early years of life. Biophobia can take a variety of forms and range from discomfort in natural areas to active scorn for whatever is not made or managed by humans. Biophobia is also manifested in the tendency to regard nature as nothing more than resources to be used. The concepts of “wild” and “wildlife” are viewed in negative ways.

Introducing children to the wonders of nature, then, is important to the environment as it is to children. As already mentioned, without frequent



positive experiences with the natural environment, children are likely to develop fears, phobias, and prejudices against nature. Such attitudes and feelings can become major obstacles to later understandings of and respect for the natural world. There is, in fact, strong evidence suggesting that, to be effective, the development of an environmental ethic must start at the early childhood level, as this is the period of life when basic attitudes and values are established (Wilson, 1994b).

There's no doubt that the early years mark a period of rapid growth for children in terms of their cognitive, socioemotional, and moral development. The early years are also a fundamental period for the formation of positive environmental attitudes and a commitment to caring for the Earth. The early childhood years offer tremendous opportunities to foster the child's understanding and appreciation of the environment and to develop a lifelong commitment to caring for the natural world. The outcome for the future will be an environmentally concerned citizenry that will relate to the Earth in a more harmonious way than that of the present generation.

The premise that introducing children to nature during the early childhood years will lead to more environmentally responsible decisions later in life is supported by an impressive body of research. Some of this research has been referred to as "significant life experiences" research. This research is based on the question "What experiences have led people to commit themselves to working for the environment?" Across different cultures and other areas of

diversity, the top two factors leading to a commitment to the environment are (1) frequent positive experiences with nature early in life and (2) at least one adult who shares the child's interest in the environment. Environmental education at the early childhood level is designed to do both – that is, provide opportunities for children to have frequent positive experiences with nature and to provide adult companionship and guidance in explorations of the out-of-doors. From such experiences, bloom love and care for the world of nature.

There has also been some research on what happens when we inform people about environmental concerns and urge them to live in more environmentally responsible ways. This research indicates that information alone is rarely enough to change people's behaviors towards the environment. Love for the natural world and an appreciation for its beauty and complexity are far more motivating in getting people to take care of the Earth than telling them what needs to be done.

Hopes for creating an ecologically sensitive society rest to a great extent on how we educate our children. Fostering a positive environmental ethic at the early childhood level can serve as a critical step in developing an environmentally literate and concerned citizenry.

But children need places where they can be immersed in nature that both honor the beauty and integrity of the Earth and provide a safe habitat for children. With this in mind, Moore and Cosco (2006), advocate attention to the following key childhood environmental policy issues:

- Landscape conservation – Protect and conserve landscape features with high educational and ecological significance (woodlands, streams, rock outcroppings, mature trees, etc.), especially in areas where childcare centers, schools, and residential neighborhoods are constructed.
- Preservation of special childhood places – Places with unusual characteristics are especially attractive to children. These may include both natural places and some people-constructed places (e.g. orchards, old buildings, and other types of structures, such as gates and bridges).
- Livable streets – Design features should include sidewalks, trees, other types of vegetation, and measures to minimize and calm traffic.
- Urban wildlife management – Places where children play (schoolyards, backyards, and community playgrounds) should include natural features that attract such wildlife as birds, butterflies, toads, snails, and earthworms.
- Rough ground – Places where children play (schoolyards, backyards, and community playgrounds) should include natural features that allow children to feel free and interact with nature (e.g. dig in the dirt, manipulate natural materials, pour water, etc.).
- Access to diverse natural landscapes – Communities should provide convenient, feasible access to diverse natural landscapes, as effective child development is dependent on richness of experience.

Educational models connecting children with nature

The idea of connecting children with nature is not new to early childhood education. Educators, in both formal settings (schools) and non-formal settings (e.g. children's museums), have been using nature as a topic, context, and motivation for learning over the years. Today, however, the use of computers, videos, educational TV, other commercially packaged materials, and an emphasis on testing based on "book learning" have greatly diminished the extent to which children and nature are connected through educational programs.

The theory and research behind some educational models provide support for a return to closer linkages with the natural environment. Such models are based on the understanding that young children and nature have much in common. Both grow better when carefully nurtured and both engender a sense of joy and excitement. Froebel, the founder of the kindergarten movement, suggested a "children's garden" as the most appropriate setting for the education of young children, and the curriculum that he developed was based on the child's inherent need to play. This was a radical idea for his day (Wellhousen, 2002). According to Froebel, the outdoor environment and activities should be as carefully planned and implemented as those indoors and both should focus on children's interaction with the natural world. Froebel encouraged the planting and watering of seeds, frequent nature walks where children and their teacher could explore the natural world together, and a variety of loose materials that allow children to build and experiment.

The Reggio Emilia approach to education is another model that wed children and the environment. In fact, one of the guiding principles of this approach is the understanding that the environment serves "as a third teacher" (Ceppi and Zini, 1998). Both the indoor and outdoor environments are carefully considered and constructed, with the use of natural materials being emphasized throughout. The use of natural materials is seen in the decoration of the room and in the materials available for investigation and creativity. Long uninterrupted periods of time outdoors are also provided to allow for child-directed exploration and play.

Fostering a sense of wonder

We sometimes talk about the "gifts of nature" – what an apt description of what nature offers to human development and enjoyment of life! Philosophers, psychologists, and nature writers often use this term in describing how nature lifts and inspires us. We also see that nature fosters creativity and imagination, as so much of art is inspired by the beauty and mystery of the natural world. For many, nature soothes and comforts, as well. People often turn to nature when stressed or confused. A special place by the sea, under a tree, or in a garden, helps many of us find a sense of peace. Children experience similar gifts of comfort, calm, and peace when engaged with nature.



Rachel Carson speaks of another gift, as well – the gift of a sense of wonder. Carson believes that children have an inborn sense of wonder that can serve “as an unfailing antidote against the boredom and disenchantments of later years, the sterile preoccupation with things that are artificial, the alienation from the sources of our strength” (1956, p. 43).

To keep this sense of wonder alive, children need frequent opportunities to play freely and creatively in natural outdoor playspaces that are rich in beauty and variety. They need soul-enriching experiences to grow into the fullness of what it means to be human. It is through the medium of the natural world that they are most likely to encounter such experiences. Among other things, nature-related experiences foster the child’s emerging sense of wonder, which is one of the primary sources of knowledge. In fact, some philosophers and educational psychologists contend that it is only through wonder that we can come to know the world as it really is.

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