

Potential Benefits from Interacting with Nature

A look at Outdoor Education for children

A Senior Project

presented to

the Faculty of the Psychology and Child Development Department

California Polytechnic State University, San Luis Obispo

In Partial Fulfillment

of the Requirements for the Degree

Bachelor of Science

by

Katie Webster

May, 2011

© Katie Webster, 2011

Introduction

In today's society, children are spending an increased amount of time indoors and therefore not spending as much time outdoors in natural surroundings. On average, American children are spending 7 hours and 38 minutes per day (53 hours per week) indoors (Coyle, 2010). The days of spending time playing in backyards building forts and chasing squirrels has been replaced with video and computer games, riding around in cars, and viewing nature as something that is looked at and not touched. While this may be a trend in society, children are losing the potential benefits that can be fostered by engaging with an outdoor setting. Nature Deficit Disorder is a trend of decreased interaction with the natural environment, as defined by Richard Louv (2008), an advocate for returning children to nature and one of the main leaders in raising awareness of Nature Deficiency. Although Nature Deficit Disorder is not currently an existing professional medical diagnosis, according to Louv, it can be used to "describe the human costs of alienation from nature, among them: diminished use of the senses, attention difficulties and higher rates of physical and emotional illness" (Louv, 2008, pg 36). Trends are showing that outdoor interactions have the potential of nurturing children's development cognitively, socially, emotionally, and physically (Coyle, 2010).

This paper will focus in on the benefits that can be gained developmentally from engaging with the outdoors based on previous research and provide suggestions on how schools can help promote the various areas of development. There is some research, but very limited, that supports this new movement which focuses on the benefits "gained in the presence of the natural world" (Louv, 2008, pg 36) rather than examining the effects of when nature fades from life; however, the research is very limited and needs more support. This is a new topic of research and though there has been some potential benefits shown, they need to be investigated

more to prove the results. By pointing out the benefits, this paper holds promise of highlighting the benefits of being outdoors in the hope of convincing educators and parents that it is a worthwhile endeavor to invest their time in cultivating new resources and opportunities to get students outside during the day to explore with freedom. To have such freedom implies that adult caretakers will “tolerate the scratches, muddy knees, and wet shoes” (Chawla, 2006, pg 68) that allows the child to find rewards in the natural world that stimulates their “initiatives and encourages their continuing engagement” (pg 68) by nature’s responsive affordances. Nature shows immediate reinforcements to children’s actions which simultaneously show them how the world works and their own capabilities.

General Trends in Outdoor Interaction

With children spending close to 7 hours a day indoors and starting to show an increase in aggressive behavior, researchers are beginning to inquire if being outdoors and interacting with a natural environment could counteract the negative effects of the indoor lifestyle through stimulating cognitive development (Rideout, Foehr, Roberts, Kaiser, 2010). In a survey conducted by the National Wildlife Federation in the spring of 2010, 1900 educators believed that “78% of children who spend regular time in unstructured outdoor play are better able to concentrate and perform better in the classroom; while 75% also felt that students who spend regular time outdoors tend to be more creative and better able to do problem solving in the classroom” (Coyle, 2010, p. 11).

Maller (2009) conducted a study with the purpose of understanding the benefits of children having hands-on contact with nature while in school settings. The study involved face-to-face interviews with twelve school principals and their lead teachers who were specifically

selected for their outdoor education programs set up at their school and classroom, as well as seven professionals from the environmental education industry. Industry participants included coordinators of community gardens, managers of environmental education organizations, practitioners, or education coordinators at children's gardens (etc). Principals and teachers were asked about the activities provided at their school, any barriers encountered in the setting, and their observed outcomes and understandings of the children's mental, emotional and social health changes throughout the time in their program. The industry participants were asked questions regarding the context of environmental education and activities involving the children having hands-on exposure with nature, and what their perception of these different activities outcomes have on the children's mental emotional and social health. In his findings, Maller noted that the principals, teacher's, and industry workers felt that the major benefits of hands-on interaction with the environment showed improvements in the student's "mental health and wellbeing, including stress reduction, improving the ability to concentrate, alleviating the effects of depression, and improving self-esteem" (Maller, 2009, p. 523). The ecological theory, which speculates that the environment has a direct interaction and influence on all organisms, including humans, supports the idea that the outdoors may be a more positive learning environment for children (Maller, 2009). This study suggests that contact with nature is important for children by promoting imagination and creativity, cognitive and intellectual development, and enhancing social relationships which further supports the ecological theory (Maller, 2009).

In addition, interaction with the outdoors is also showing support for the educational theory of multiple intelligences developed by Dr. Howard Gardener (1989) of Harvard University, which suggests that all children have seven intelligences: linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal, and naturalist intelligence

(Gardener & Hatch, 1989, p. 6). It is suggested by Maller (2009) that by encouraging children to be in the outdoors, they will become active learners through sight, touch and sound, all of which will help stimulate all seven of the child's intelligences. Learning is a process that brings cognitive, emotional and environmental influences and experiences together to make changes to one's knowledge (Gardener & Hatch, 1989). Contact with nature "facilitates children's understanding of their place in the world and develops their cognitive, emotional and spiritual connections to the social and biophysical world around them" (Maller, 2009, p. 524).

Outdoor Environment's Influences on Child Development

Children's play has changed from being mostly outdoors, to indoor media related activities. Unstructured, outdoor play has the potential to help children develop a full sense of well-being: physically, cognitively, socially and emotionally. Since so many aspects of well-being is affected by children's play it is important to encourage children to be active in play and use terminology like 'play' rather than 'physical health' to connect to the child's interest of being active (Burdette, 2005).

Physical Health

The first way that the outdoor environment can benefit children is through physical health development. Children who are outdoors more often not only develop a strengthened immune system, but they gain skills showing that they are better at balancing, agility, dexterity, and depth perception as stated by the National Wildlife Federation's report on "Creating High Performance Learners" (Coyle, 2010). Since children exposed to the outdoors are more likely to develop these skills, they are theoretically likely to experience fewer injuries from accidents because they

are better at assessing risks (Coyle, 2010). One of the most important aspects of physical benefits is that children who are exposed to the outdoors have higher levels of concentration skills and are better at expressing good behavior in classrooms, which therefore stimulates their learning (Coyle, 2010).

Outdoor play is one of the best ways children develop their basic motor skills and coordination (Burdette, 2005). By simply running around and interacting with the outside environment helps develop coordination by giving the child experience using hands, feet, arms and legs that help them move around. Though children can move around in most environments, the outdoors is the least restrictive on the child's range of movement. Without the time to stimulate movement in the body to stretch and exercise, children are put at a large health risk for future problems.

Obesity

Playing outdoors in a natural environment has a direct correlation with increasing children's physical activity due to more room to move around. However, trends are showing that children are spending more and more time indoors where they can become withdrawn from others. With the large decrease in physical activity and increased time inside, the Centers for Disease Control (CDC) has measured over the past 20 years that the prevalence of obesity among children ages 6 to 11 has more than doubled reaching 17% and is even higher for adolescents. Once a child is obese, there is a 70% chance of the child being obese as adults which puts them at high risk of raising an obese child (Kohatsu, Maizes, Miller, Rich, Stenmark & Weil, 2010).

Obesity may only be the first step in a child's health concerns. A growing number of

studies suggest that:

“this disconnection between nature and children, this nature-deficit disorder, may be associated with an epidemic of childhood obesity, childhood diabetes, decreased Vitamin D intake, behavior disorders, depression and a diminished sense of place and community. Heightened health problems, higher stress, higher aggression, reduced cognitive and creative capacities, lower school achievement, blighted sense of efficacy, and diminished productivity are among the possible associated negative impacts.” (Charles, Louv, Bodner, Bill, Stahl, 2009, p. 19)

Outdoor time is directly linked to time children will have to burn off their extra energy. The CDC recommends that children spend at least one hour per day outside in physical activity (Kohatsu et al., 2010). Once the child is outdoors, games (such as running, jumping, climbing) are automatically incorporated into the physical activity which takes the stress off of having to exercise and places importance on just having fun.

Cognitive Development & Academic Achievement

With the children being outdoors and running off excess amounts of energy and coming back into classrooms better able to concentrate on the materials at hand, the students are going to gain more out of the academic material cognitively because they are ready to engage in the activity. If children spend enough time outdoors, they will be more relaxed in the academic environment, making it easier for them to learn. The ideas behind the outdoor education programs in America are stemming from established programs in Northern Europe and Scandinavian countries where Forest Kindergartens are a norm for everyday child education (Coyle, 2010).

Forest Kindertagesstätten originated in Germany by a Swiss educator Johann Pestalozzi in an attempt to implement Jean Jacques Rousseau's philosophy of education that children should avoid books until they are at least 12 years of age. Though Pestalozzi did not take the age and limits of learning to this extreme, his school did feature the method of nature walks through the countryside to teach botany, geology, and zoology to the children. This method was based on Rousseau's "conviction that education must be rooted in firsthand experiences and not in reading the reports of others" (Sax, 2001, p. 3). Pestalozzi and one of his teachers, Froebel, believed children younger than seven are too young to be in school, and it was illegal in many German states for children less than seven to attend any school. So in 1837, Froebel opened the first school for children three to six years old and called it kindertagesstätte—meaning 'children's garden' or 'garden of children' (Sax, 2001).

In these Forest Kindertagesstätten, children spend their day with the freedom of interacting and engaging with a natural environment outdoors. Looking at trends of how outdoor education benefits cognitive development, researchers have started looking at how some children in Northern Europe develop after attending a Forest Kindertagesstätte. Roland Gorges, a German researcher, has found that children who had attended a Forest Kindertagesstätte were above average academically when compared by the teacher to other students who had not gone through an outdoor education program. Gorges specifically saw a noticeable difference in areas such as: "knowledge and skills in specific subjects, reading and math achievement, skill in forming questions, and motivation" (Coyle, 2010, p. 10). It is theorized that the outdoor environment exposes children to a wide variety of variables that stimulates inquiry and interest in real-world situations and experiences. Observations show that "children engage in more creative and dramatic social play in natural spaces than they do in built playgrounds or spaces without trees or

grass” (Chawla, 2006, p. 68). Therefore, the more interaction with a “larger number of environmental variables we expose children to, the more inventiveness and creativity we will observe” (Coyle, 2010, p. 11) from the children as they are stimulated to use their imagination in the non-manufactured environment.

When interacting with the outdoors, children are more likely to come across opportunities that are going to require some sort of decision making skills. This interaction with a varied environment of the outdoors helps develop their problem solving and creative thinking skills (Burdette, 2005). When presented with different problems and issues, children will learn over time how to go about solving them. The more problems the children encountered in their natural environment, hopefully they will develop the skills to appropriately navigate through them and apply that knowledge to problems they encounter later in life. It is through the process of trial and error, seeing what works and what does not, that children are going to learn lessons. Adults can tell children to do many things; however, it is not until they experience a situation that the information sticks in their mind.

Social & Emotional Benefits

Almost all play is an opportunity for children to interact with others: parents, siblings, and peers. When play is taken outdoors, the options available allowing for various roles to be taken on and more creativity can be taken without any structured configuration. Within play, different people play the roles of being the leader or the follower, both of which require cooperation to develop and sustain a friendship (Coyle, 2010). Within these playful interactions, children will develop problem solving skills for dealing with social interactions (deciding what to play, who can play, rules of the engagement, etc) that develop throughout the process of play.

Through these interactions with other children, emotions will arise that will either benefit or hinder the relationship. For example, if a child has a hard time sharing, he/she may get mad when another child wants to play with the object. Flexibility, empathy, self-awareness, and self-regulation are all emotional capabilities that are tested and cultivated in the social, playing environment (Burdette, 2005). These emotional capabilities are essential to successfully interact in the adult social world that leads to achievement in the workplace and intimate social relationships.

Free play also has the ability of reducing the risk of negative emotions that put a person at emotional well-being risks. As stated in the *Development of Children* by Cole, Cole, and Lightfoot (2005), children feel a wide variety of extreme emotions. Play is one way for the children to learn how to control their emotions that links to controlling their thoughts and actions. Burdette (2005) suggests that interaction with others in play can help minimize anxiety, depression, aggression, and sleep problems. By being active, moods can improve and anxiety can be decreased. There is also the benefit of exposure to sunlight when activity is taken outdoors, which improves a person's disposition (Burdette, 2005). Janet E. Dymont (2005) observed in the Toronto School District that the level of positive and civil behavior among students has greatly increased since the school initiated a natural, green school campus for the children to play and learn in. It was noticed that when children were communicating to each other, they were more effective when done outside in an unrestrictive environment. This is thought to be because there are more options of ways to interact (Dymont, 2005). Cooperation amongst the students in the Toronto School District also improved greatly once the schools made the transition from a concrete manicured outdoor environment into a more earthy, natural setting. Because there were less structured playgrounds, the children were more creative in their

activities which allowed for more inclusion and cooperation within the groups of students (Dyment, 2005). Overall, the students pro-social behavior (respectfulness, cooperation, non-violent behavior) has greatly increased since the schools got involved with providing a greener environment for the children to interact with (Dyment, 2005).

Interventions & Practice in the School

Over the years, many schools have spent time and money on converting their green fields lined with trees into contemporary playgrounds sculpted with sand, concrete and turf playground areas. This style of playground, unfortunately, is aesthetically attractive to adults, but may inhibit the developmental advances in play behavior in children (Hart and Sheehan, 1986). With awareness rising of the benefits the original natural settings provided, schools are slowly re-landscaping their grounds to reflect a more authentic environment with the hope of stimulating learning through the diverse environment, social relationships, and improved student health.

The Toronto District School Board has initiated a change in their elementary, middle, and high school campuses to go from turf and asphalt settings into being green environments—a place filled with trees, grass, and vegetable and floral for birds, butterflies, and bugs to inhabit. Within this transformation, Dyment (2005) looked at how the different school environment is impacting the students. Through a series of four questionnaires and follow-up interviews distributed to 100 schools (total of 400 questionnaires), a total of 41 principals, 39 teachers involved in the greening project, 36 teachers not involved with the greening project, and 33 parents involved with the greening project participated. The majority of participants agreed that the greened school grounds were having a positive influence on how the curriculum was being delivered and received. Teacher's motivation for teaching was rejuvenated and they became

more willing to use innovative instructional strategies (Dyment, 2005, p. 13). By being in a green environment, teachers are more able to accommodate students with many different learning styles because they have access to more hands-on materials for the students to interact with (Dyment, 2005). Through these hands-on interactions, the students' academic performance and their enthusiasm/engagement for learning have significantly increased (Dyment, 2005). Children's behavior, environmental awareness, and health and safety issues also improved through the process of greening the various campuses in the Toronto District. Though science lessons were the main focus of improvement, other areas of learning have benefitted from taking place outside such as art (sketching of different objects), literacy (learning the names of different plants and objects) and mathematics (measurements as things grow over time, finding the volume) and physical education.

Of the 100 different schools that were sent questionnaires, the statements and responses remained relatively the same showing results of improved academic performance, enhanced social relations and much more for students who attended a school with a greened environment. With this trend, it would be encouraging to reproduce the greening project in other school to see if developmental stimulation occurs.

Recess

Many schools do not have the opportunity or availability of a natural play area to provide their students with. So if children are at school, a break, recess, gives the students a chance to go outside and change their environment scenery, with the addition of fresh air. In a review of available literature, Trudeau and Shephard (2008) investigated whether academic achievement and involvement in outdoor activity programs, such as physical education, free school physical

activity and school sports, have a negative relationship. Current literature and research indicated that outdoor time for curricular activity “does not affect the academic performance of primary school students negatively” (Trudeau & Shephard, 2008, p. 1) even though the extra time spent outdoors is reducing time spent in the classroom learning. What they did find in their review was that children who spent more time outdoors displayed higher concentration, cooperation, motivation, creativity, and problem solving skills in the classroom. Trudeau and Shephard (2008) conclude that research is suggesting that there is a positive relationship between physical activity and intellectual performance. Due to school budget cuts and limited classroom time, schools are cutting back on necessary recess time that would allow children to be outdoors for a set amount of time during the day.

According to a survey conducted by the American Association for the Child’s Right to Play, “about 40% of public schools have eliminated or are planning to eliminate more than one recess period from the school day” (Barros, Silver & Stein, 2009, p. 432). Children learn more quickly when efforts on a task are distributed (given breaks) over time rather than long concentrated efforts (Pellegrini & Bjorklund, 1997). Time can be taken out of the school day from academic subjects in order to include physical activity without hindering academic performance; however, excluding physical activity to create more time for academics is not shown to enhance grades (Trudeau & Shephard, 2008). Recess allows children a mental break and renews their attentive skills (Ridgway, Northup, Pellegrin, LaRue, & Hightsoe, 2003).

Pellegrini, Huberty and Jones (1995) conducted a series of three field experiments to help determine the effects recess has on classroom behavior. All experiments were conducted at a public elementary school in southeastern United States on three classrooms: a Kindergarten, Grade 2 and Grade 4 using an observational method. With four observers blind to the research

hypothesis; the experiments consisted of examining the effects of confinement in the classroom while specifically looking at the student's attentiveness before and after recess. The second two experiments were replications of the first but conducted a year apart to test for reliability. Results before recess showed that the children, especially boys, expressed an increased amount of inattentive behavior as their amount of classroom confinement grew. The more time in the classroom, the more inattentive the boys were. However, post recess results were a bit inconclusive because there were various limitations of the study that included a change in the children's schedule and the different types of interactions the students had out at recess. Therefore, Pellegrini et. al (1995) could not make conclusion by comparing on pre-recess behavior with post-recess behavior.

Jarret, Maxwell, Dickerson, Hoge, Davies and Yetley (1998) examined the effect of a recess break on classroom behavior (specifically working, fidgeting, and listlessness). Participants included 43 children attending two Grade 4 classrooms in a southern United State's urban school where they distinctly have a policy against recess. In this particular study, Jarret et al. (1998) used the 43 students as their own controls by observing them for three school days with no recess and another three school days with recess. This was made possible because the researchers had the school agree to allow them to instate recess for a couple of days specifically for their observations. To the researchers' surprise, results showed that about 60% of the children benefitted considerably on days when there was recess instated by either working more or fidgeting less, and in some cases, the student improved by working more and fidgeting less as measured by the researcher's in class observations.

Attention-Deficit Hyperactivity Disorder (ADHD)

Some children have a hard time concentrating in the classroom due to short attention spans. One way to help improve student's attentive behavior in the classroom is by providing a recess break for the children to move around. Jarret et al. (1998) was surprised to find that all five of the students in the class diagnosed with Attention-Deficit Hyperactivity Disorder (ADHD) were included in the 60% with improved behavior. Though all of the students with ADHD showed improvements in behavior due to recess in Jarret et al.'s study, it should be noted that "no one treatment works for all children with a diagnosis of ADHD" (Ridgway et al. 2003, p. 255).

Ridgway et al. (2003) found similar results after conducting a study of 8-year-old children in Grade 2 at a private school. This study specifically concentrated on how recess could facilitate behavioral changes (specifically measuring: off task, inappropriate vocalization, out of seat, fidgeting and playing with objects) in children diagnosed with ADHD as compared to their non-ADHD peers on days with or without recess. The three main participants (each from a different classroom) were selected based on their previous diagnosis of ADHD. The teachers in each class were asked to select three typical students in their class to create a control group in order to compare the typical students' behavior with the student diagnosed with ADHD. Observations were conducted every 30 minutes for 10 minute intervals over 3 days with no recess and then an additional 3 days with a 9:45a.m. recess (Ridgway et al., 2003). Results showed increased levels of inappropriate behavior throughout the day in all participants (peer group and ADHD students) on days when recess was not a part of the schedule. However, on days when the participants did have a morning recess, the progressive increase in negative behavior did not occur for all the ADHD students (p. 259).

Both findings from Jarret et al. (1998) and Ridgway et al. (2003) studies showed that the longer children are confined to the classroom, the more often inappropriate behavior (disruptive talking, fidgeting, out of seat, off task, etc.) occurred. Such behavior is one of the main indicators teachers use to make referrals to doctors for diagnosing children with ADHD. This suggests that by keeping the children confined to the classroom and therefore increasing their adverse behavior, teachers may be incorrectly making referrals to diagnose children with ADHD.

Barros et al. (2009) conducted a secondary analysis of a public-use data set, the Early Childhood Longitudinal Study, Kindergarten Class of 1998-1999, and third grade data set in order to look at teacher ratings of classroom behavior. Children, ages 8-9 years of age, were categorized into two levels; those with some recess (> 15 minutes) and those with little to no recess (<15 minutes). Their classroom behavior was measured by using the teacher's rating of class behavior (TRCB)—a rating also used to base referrals of behavior to doctors for scores that stand out. It was found that when children had some recess, they were more likely to have higher teacher's ratings and therefore are less likely to be referred to the doctor for behavioral diagnoses—specifically ADHD. This analysis demonstrated that recess plays an important role in “learning, social development, and health” (Barros et al., 2009, p. 435) for elementary school children. If a child is already diagnosed with ADHD, breaks from classroom activities can help improve the concentration once back in the classroom (Ridgway et al. 2003). Research has shown that confinement to uninterrupted instructional time does not benefit children's learning because humans learn best when there are breaks throughout the learning process (Jarret et al., 1998). Findings show that after recess, children were more on task, less fidgety and focused on what their teacher was doing (Ridgway et al., 2003) as well as focus on assigned tasks (Barros et al., 2009).

In addition to recess, researchers at the University of Illinois have found strong indications that “exposure to natural setting in the course of common afterschool and weekend activities may be widely effective in reducing ADHD symptoms” (Taylor & Kuo, 2008, p. 403). Researchers conducted a study on seventeen 7-12 year old children previously diagnosed with ADHD by comparing their responses to three different types of environments: 1) indoors, 2) outdoors in spaces without much greenery—parking lots, downtown areas, 3) relatively natural outdoor settings—tree-lined street, backyard, or park. The researchers conducted a pretest of having the children work on a series of puzzles that required focus, and then took them for a 20 minute walk in the three different environments. After each walk, the child took a test on their concentration skills by responding to questions about their walking experience. Results showed that children concentrated best after walking in the natural outdoor setting. Researchers linked this finding to show how outdoor spaces—“groves of trees, natural play areas, school gardens—add to a student’s desire to learn and facilitates the overall learning process by tapping into many aspects of the student’s deep-seeded native intelligences” (Taylor & Kuo, 2008, p. 406).

Summary

When raising children, one should be focused on helping the child develop in multiple different ways with the goal of the child becoming independent. Being involved with the outdoors, whether through unstructured play or outdoor education, can help stimulate development in multiple different ways. The overall well-being of a child, though it sounds ambiguous, is defined by the World Health Organization as the state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity (Humberstone & Stan, 2009).

Most parents and educators see the main benefit of sending their child outdoors as a way to improve physical health, specifically to help prevent obesity. However, adults should look at being outdoors as a way to stimulate the development of motor skills, cognitive development, fuel social interactions and arouse various emotions. Being outside in a natural environment opens up a wide amount of opportunities for risk assessment, problem solving, creative play, and room to run around exercising.

Schools can make a change in the way classrooms are taught and where the students are learning. It is showing to be important for campuses to be filled with a natural green environment full of grassy yards, trees and gardens for the children to have hands on experiences. The simple sight of plants in a classroom or outside the windows has positive effects on the student's attention span (Dyment, 2005). But to take it even one more step, teachers can take their class outside to observe and interact with the environment to connect hands-on experiences to the various curriculum. Most importantly, schools should provide a recess to allow children a break from their studies to have a change of task and a change of pace. Children attend school about seven hours a day, five days a week. This makes the school one of the biggest influential factors and regulators of the structure of experiences that can help the children develop if provided with the appropriate environment. If given breaks throughout the day, children are less likely to show symptoms of ADHD.

Being outdoors does not automatically mean that children are going to benefit directly. What is being suggested in this paper is that children need a varied amount of experience and the outdoors provides multiple different contexts for children to learn and experience things within if they are interactive in exploring the environment. Learning in the environment provides children

the opportunity to connect knowledge to real life situations and contexts rather than having the curriculum separate from their life (White, 2004).

Recommendations

In order to help promote children's interaction with the natural outdoor environment, there are many ways to get involved. Dymont (2005) expressed a large increase in benefits seen in the greening process of the Toronto School District. However, there could be more interaction. Most of the teachers involved with the greening program expressed difficulty in taking their students outside because they were not fully aware of what kind of activities they could do and what materials they could use to connect standard curriculum to the outdoors. Many of the teachers were also hesitant in taking their class outdoors because they did not have enough assistance to watch and help the children. As a parent or volunteer, being there to support the teacher allows more freedom and availability for the students to get to go outside. School districts can also invest the time and money in training their teachers to learn how to use the green school grounds and how to manage their classroom while outdoors. There are a wide variety of programs, such as Project Learning Tree and the Countryside Alliance Foundation, which can be a huge resource for teachers to use to help be more prepared.

Parents, teachers, and school boards can help promote the development of a stimulating, green environment by making suggestions and helping the school redesign the campus grounds.

Some things that are important to include are:

- Nooks and crannies to provide places for social interactions
- Various vegetation to stimulate different discoveries and curiosities
- Provide natural places to sit in, on, under, lean against, climb and provide shade

- Water
- Gardens to help demonstrate where fresh fruits and vegetables come from

When children are not at school, parents and caregivers can help children get outside by taking them to parks and recreation areas, go camping, or let them explore a patch of natural area close to your home. A lot of parents are scared of letting their children go outdoors because they fear their child will get hurt. Parents need to get past their fear and allow their children to have a chance of taking risks and getting injured so that they can learn through trial and error and practice making decisions for themselves.

Resources

- Barros, R., Silver, E., & Stein, R. (2009). School recess and group classroom behavior. *Pediatrics: Official Journal of the American Academy of Pediatrics*, 123, 431-436. doi:10.1542/peds.2007-2825.
- Burdette, H. L., Whitaker, R. C. (2005). Resurrecting free play in young children: Looking beyond fitness and fatness to attention, affiliation, and affect. *Archives of Pediatrics & Adolescent Medicine*, 159, 46-50.
- Charles, C., Louv, R., Bodner, L., Bill, G., Stahl, D. (2009) Children and nature 2009: A report on the movement to reconnect children to the natural world. *Children & Nature Network*, 1-55.
- Chawla, L. (2006). Learning to love the natural world enough to protect it. *Norsk senter for barneforskning*, 2, 57-78.
- Coyle, K. J. (2010). Back to school: back outside! How outdoor education and outdoor school time create high performance students. *National Wildlife Federation*, 1-41.
- Dyment, J. E. (2005). Gaining ground: The power and potential of school ground greening in the Toronto district school board. Retrieved October 20, 2010 from <http://www.evergreen.ca/en/resources/schools/research-policy.sn>
- Gardner, H., Hatch, T. (1989). Multiple intelligences go to school: Educational implications of the theory of multiple intelligences. *Educational Researcher* 18(8), pg 4-10.
- Hart, C.H., Sheehan, R. (1986). Preschoolers' play behavior in outdoor environments: Effects of traditional and contemporary playgrounds. *American Educational Research Journal*, 23(4), 668-678.

- Humberstone, B., Stan, I. (2009). Well-being and outdoor pedagogies in primary schooling: The nexus of well-being and safety. *Australian Journal of Outdoor Education*, 13(2), 24-32.
- Jarrett, O., Maxwell, D., Dickerson, C., Hoge, P., Davies, G., & Yetley, A. (1998). Impact of recess on classroom behavior: Group effects and individual differences. *Journal of Educational Research*, 92(2), 121-126. doi:10.1080/00220679809597584.
- Kohatsu, W., Maizes, V., Miller, D., Rich, M., Stenmark, S., Weil, A. (2010). Whole Child: Developing Mind, Body and Spirit through Outdoor Play. *Be Out There- National Wildlife Federation*. Retrieved October 18, 2010 from <http://www.nwf.org/News-and-Magazines/Media-Center/Reports/Archive/2010/Whole-Child-Be-Out-There.aspx>
- Louv, R. (2008). Last child in the woods: Saving our children from nature-deficit disorder. Chapel Hill: Algonquin Books.
- Maller, C.J. (2009). Promoting children's mental, emotional and social health through contact with nature: A model. *Health Education Journal*, 109(6), 522-542. doi:10.1108/09654280911001185.
- Pellegrini, A., & Bjorklund, D. (1997). The role of recess in children's cognitive performance. *Educational Psychologist*, 32(1), 35-40. doi:10.1207/s15326985ep3201_3.
- Pellegrini, A.D., Huberty, P.D., & Jones, I. (1995). The effects of recess timing on children's playground and classroom behaviors. *American Educational Research Journal*, 32(4), 845-864.
- Rideout, V., Foehr, U., Roberts, D., Kaiser, H. (2010). Generation M2: media in the lives of 8- to 18-year-olds. *Henry J Kaiser Family Foundation*, Menlo Park, CA.

- Ridgway, A., Northup, J., Pellegrini, A., LaRue, R., & Hightsoe, A. (2003). Effects of recess on the classroom behavior of children with and without Attention-Deficit Hyperactivity Disorder. *School Psychology Quarterly, 18*(3), 253-268. doi: 10.1521/scpq.18.3.253.22578.
- Sax, L. (2001). Reclaiming kindergarten: Making kindergarten less harmful to boys. *Psychology of Men & Masculinity, 2*(1), 3-12. doi 10.1037//1524-9220.2.13.
- Taylor, A.F. & Kuo, F.E. (2009). Children with attention deficits concentrate better after walk in the park. *Journal of Attention Disorders, 12*(5), 402-409. doi: 10.1177/1087054708323000.
- Trudeau, F. & Shephard, R. J. (2008). Physical education, school physical activity, school sports and academic performance. *International Journal of Behavioral Nutrition and Physical Activity*. BioMed Central Ltd. Doi:10.1186/1479-5868-5-10.
<http://www.ijbnpa.org/content/5/1/10>.
- White, R. (2004). Young Children's Relationship with nature: Its importance to children's development & the earth's future. *White Hutchinson Leisure & Learning Group*. Retrieved October 20, 2010 from <http://www.childrenandnature.org/research/volumes/C16/16>