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Nature and the Outdoor Learning Environment: The Forgotten Resource in Early Childhood Education

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> *"The whole playground is so much more engaging; the kids are neither overwhelmed nor bored. They didn't run before…now they run. Our proudest moment has to be watching the children with the natural elements: flowers, branches, overcoming fear of bees, worms, butterflies, and crickets."* (Childcare professional at Munchkin Academy, Buxton, NC, describing the impact of enhancements to the center's outdoor setting.)

Longitudinal studies now confirm the economic, academic, and social importance of high-quality early childhood education. At the same time, a substantial body of research indicates that an outdoor learning and play environment with diverse natural elements advances and enriches all of the domains relevant to the development, health, and wellbeing of young children. Despite these findings, the outdoor learning environment goes virtually unmentioned in national and state level standards, guidelines, and regulations, and has been largely overlooked in the considerable efforts to enhance the quality of early childhood education (ECE). Moreover, children most likely to benefit from an outdoor play and learning environment are less likely to have access to one.

A natural outdoor play and learning environment is outdoor space at an early childhood education center that includes diverse features designed to promote structured and unstructured physical activity, play, and learning. The two photos below, provided by the Natural Learning Initiative at North Carolina State University, show the Munchkin Academy in Buxton, North Carolina before and after addition of trees and shrubs, raised garden beds, and a looping pathway:

This article lays out recommendations for increasing the availability and use of natural outdoor play and learning environments in order to improve the quality of ECE. The article begins with a summary of research indicating the contribution of an outdoor learning environment to the domains of ECE; describes the current policy related to the outdoor learning environment and nature exploration in state regulations; identifies model policy content in key areas; and concludes with specific actions that will increase availability of quality outdoor learning environments.

Benefits of Natural Outdoor Play and Learning Environments

- Improves self-regulation
- Advances physical fitness and gross motor development
- Improves nutrition
- Improves eyesight
- Promotes cognitive development
- Improves academic performance
- Lessens the symptoms of ADHD and improves concentration
- Promotes self-confidence
- Builds understanding and appreciation of ecosystems, food systems, and environmental processes

Proposed Minimum Standards to Promote Quality Natural Outdoor Learning Environments

- Formally designate the outdoor space an outdoor play and learning environment or similar
- The outdoor play and learning environment has at least two outdoor gross motor features (e.g., climbing features or looping pathways)
- The outdoor play and learning environment has at least two outdoor learning settings (e.g., gardening area, loose parts station, or dramatic play area)
- The outdoor play and learning environment includes a diverse selection of plants and habitats representative of local flora and fauna
- The outdoor play and learning environment includes natural features that enrich children's play and learning such as: non-toxic trees, shrubs, or vines; topographic variations (such as mounds, terraces, slopes); a variety of ground surfaces (mulch, grass, pebbles); smooth rocks, wood or logs; non-poisonous flowering plants or garden plants and vegetables; birdfeeders, bird baths and birdhouses
- An outdoor water source for irrigation is available
- The outdoor play and learning environment has a looping pathway and wheeled toys
- At least 30 minutes of outdoor time is offered per three hours at the center.
- Consumption of fruits and vegetables grown on site is expressly allowed
- A nature supplement for early learning guidelines is adopted
- Professional development for enhancing and utilizing the outdoor play and learning environment is provided
- Each center has outdoor space of at least 75 sq. ft. per child, with exemptions granted only if daily walking outings to nearby parks or public spaces are provided

Strong evidence that nature inquiry and outdoor learning environments advance the goals of ECE

ECE programs are expected to foster the physical, mental, and social-emotional development of children, and, increasingly, to address an array of threats to American children's health and wellness.

The prevalence of overweight children ages 6 to 11 has more than doubled in the last 20 years, increasing to 18.8% in 2004, and the rate among adolescents has more than tripled (CDC 2007). Overweight and obese children suffer from a myriad of health problems, including higher risks of cardiovascular disease, diabetes, bone and joint problems, and sleep apnea (Ogden 2006). These health problems are so severe that researchers warn of the possibility that for the first time in American history, life expectancy may actually *decrease* because of the health impacts of the current childhood obesity epidemic (Olshansky et al 2005).

In the area of mental health, approximately 11% of children have been diagnosed with Attention Deficit/Hyperactivity Disorder (ADHD) with the rates of diagnosis increasing 5% per year from 2006 to 2011 (CDC 2014).

School readiness is seen as a growing responsibility in ECE, and the K-12 standards movement has had a substantial impact on ECE, with virtually every state and territory adopting Early Learning Guidelines which specify desired ECE learning and development outcomes, often aligned with K-12 standards.

If ECE is to contribute to addressing these challenges then all available resources must be mobilized. A growing body of scientific literature indicates that play and learning in a diverse, natural area provides a wide array of health, learning, gross motor, and mental health benefits for children.

Learning and Cognitive Development

- *Promotes Cognitive Development.* The "richness and novelty" of being outdoors stimulates brain development (Rivkin 2000). Research shows that "direct, ongoing experience of nature in relatively familiar settings remains a vital source for children's physical, emotional, and intellectual development" (Kellert 2004). Proximity to, views of, and daily exposure to natural settings increases children's ability to focus and enhances cognitive abilities (Wells, 2000).
- *Improves academic performance.* Studies in the US show that schools that use outdoor classrooms and other forms of nature-based experiential education show significant student gains in social studies, science, language arts, and math. Students in outdoor science programs improved their science testing scores by 27% (American Institutes for Research, 2005).

Mental Health, Self-Regulation and Improved Behavior

- *Promotes constructive, imaginative, and collaborative play.* Lower quality outdoor environments are associated with repetitive play and negative behavior, while higher quality environments are associated with more constructive play (DeBord, Hestenes, Moore, Cosco, and McGinnis 2005). Natural materials added to the outdoor environment increase children's spatial-cognitive awareness, physical competence and skills, and socialization (Herrington and Studtmann 1998). Inclusion of loose parts of natural materials increases constructive and dramatic play (Hannon and Brown 2008.)
- *Improves Self-Regulation and Reduces Stress and Aggression.* Time spent in green spaces, including parks, play areas, and gardens, has been shown to reduce stress and mental fatigue (Taylor 2001). In one study children who were exposed to greener environments in a public housing area demonstrated less aggression and violence and less mental stress (Kuo & Sullivan 2001). Just viewing nature reduces physiological stress response, increases level of interest and attention, and decreases feelings of fear and anger or aggression (Burdette & Whitaker 2005.)
- *Lessens the Symptoms of ADHD***.** Spending time outdoors reduces the severity of symptoms of children with ADHD. Even short walks in urban parks increase concentration and lessen ADHD related symptoms (Kuo & Taylor 2004, Taylor et al 2001).

- *Promotes Self-Confidence and Improves concentration***.** Children who spent time playing outside are more likely to take risks, seek out adventure, develop self-confidence and respect the value of nature (UKSDC 2007). Outdoor recreation experiences like camping can improve children's self-esteem (Marsh 1999). Green spaces outside the home can increase concentration, inhibition of initial impulses, and self-discipline (Taylor et al 2001).
- *Builds Environmental Stewardship Ethic*. A number of studies indicate that childhood contact with nature contributes to shaping a lasting environmental ethic and an interest in environmental professions (Wells & Lekies, 2006). Respondents who had played in wild natural environments were more likely to have positive perceptions of natural environments and outdoor recreation activities (Bixler & Hammitt 2001).

Physical Activity, Nutrition, and Gross Motor Development

- *Advances Physical fitness and Gross Motor Development.* Children who play outdoors are generally more fit than those who spend the majority of their time inside. Children who play outside in natural areas also show a statistically significant improvement in motor fitness with better coordination, balance, and agility (Fjortoft 2001). The mere presence (with no additional programming) of an outdoor learning environment with natural features and a looping pathway is associated with a 22% increase in physical activity (Cosco, Moore, Smith, 2014). Children's physical activity is motivated by diverse outdoor environments (Boldemann et al, 2006) and the preschool outdoors is a determinant of preschool physical activity (Cardon et al 2008.)
- *Improves nutrition.* Children who grow their own food are more likely to eat fruits and vegetables (Bell & Dyment, 2008) and to show higher levels of knowledge about nutrition (Waliczek, Bradley & Zajicek, 2001). They are also more likely to continue healthy eating habits throughout their lives (Morris & Zidenberg-Cherr, 2002). Gardens that support children's engagement with vegetables and fruits and increase frequency of consumption are associated with acceptance of diverse tastes (Cabalda et al 2011) as a positive strategy to support healthy eating (Meinen et al 2012.)
- *Improves eyesight.* More time spent outdoors is related to reduced rates of myopia (nearsightedness) in children and adolescents (Rose et al 2008).

EXISTING ECE POLICY FRAMEWORK UNDERUTILIZES THE OUTDOOR SPACE

Despite the documented benefits, a review of the ECE policy framework at federal and state levels shows a missed opportunity to use the outdoor play and learning environment to advance ECE goals. ECE is governed by a complex and decentralized regulatory structure. All mandatory regulation occurs at the state level, and consists of minimum regulatory requirements, non-mandatory Quality Rating and Improvement Systems (QRIS) which incentivize improvements to ECE, and non-mandatory early learning and development guidelines (ELG) which specify desired learning and development outcomes. At the national level, there are evaluation tools such as the Environment Rating Scale, non-mandatory accreditation systems developed by private organizations such as National Association for the Education of Young Children (NAEYC), and performance standards for Head Start centers. A review of each policy body shows virtual absence of policy or incentive related to outdoor learning and nature inquiry, with some exceptions.

A. Licensing and Administrative Regulations. State licensing regulations are the minimum standards that every licensed child care center in a state must meet. These regulations are developed and administered by state governments. A separate Natural Start Alliance comprehensive review of state licensing requirements is forthcoming, so in this article only two states—Florida and North Carolina—are contrasted in the table below to demonstrate the variety in regulatory requirements for childcare centers related to outdoor play and learning environments. Florida requires 45 square feet of outdoor space per child--with a broad exemption for centers designated urban—and no outdoor programming requirements. North Carolina, by contrast, requires a minimum 75 square feet per child, with no exemption, as well as outdoor time and programming requirements. North Carolina includes additional requirements for regular outdoor time and expressly permits the consumption of fruits and vegetables grown on-site.

	North Carolina	Florida
Outdoor space requirement	75 ft2 per child	45 ft2 per child
Outdoor space exemptions	None	Exemption for 'urban' centers
Outdoor programming requirement	At least 30 minutes, and one of four planned activities, outdoors per day, weather permitting	No requirement
Fruits and vegetables grown on site	Expressly permitted to eat if washed	No mention

Recommended enhancements to Licensing Requirements

1. Minimum outdoor space requirement of 75 square feet per child and addition of requirements to enrich the outdoor space.
2. Exemptions for minimum outdoor space only in narrow circumstances, such as when on-site outdoor space is unavailable, and daily off-site walks to nearby parks or public spaces are provided.
3. Daily outdoor programming requirement of at least 30 minutes and one planned outdoor activity per day.
4. Consumption of site-grown fruits and vegetables expressly allowed.

Vegetable gardens provide a context for learning about nature and nutrition

"We are proud of the garden - kids planting and picking: green beans, red onion, sunflowers, lettuce, carrots, mustard greens, turnip greens, spinach, squash, green peppers, tomatoes, and blueberries."

(Childcare professional)

B. Quality Rating Improvement Systems (QRIS). Quality rating improvement systems (QRIS) have been used by many states to improve the quality of child care centers above the minimum level required by licensing regulations. Thirty-five states or localities have quality rating programs. Most quality rating systems are voluntary programs where providers are assessed on a variety of standards. Some states then provide financial incentives to programs that attain higher standards, and publicize the resulting scores, so QRIS becomes a way to improve quality without public mandates. QRIS offer a powerful tool for encouraging provision and use of natural outdoor play and learning environments beyond levels required by state licensing standards, but a review of 35 QRIS standards shows that few states use QRIS standards for this purpose. Only six states have standards relating to either provision of daily time outdoors or quality of outdoor learning environments. The remaining states either leave the outdoor learning environment unaddressed, or treat it through the Environment Rating Scale, which offers only minimum consideration to the outdoor setting (discussed further below.)

Michigan's QRIS has the strongest outdoor time requirement of 30 minutes for every 3 hours and is one of only 5 states (IN, NY, MI, OK, WI) with standards related to outdoor time. Oklahoma's QRIS has a standard requiring daily outdoor time, and also has a standard specifying that at least two outdoor learning areas be available. Texas' QRIS is the only one with detailed quality standards for outdoor learning environments.

QRIS Policy Dimension	State	Exemplary Language
Outdoor time requirement	IN, NY, MI, OK, WI	MI: "30 minutes of every 3 hours dedicated to active outdoor time, with appropriate indoor physical activities available when weather prohibits outdoor play"
Quality of outdoor space requirement	IN, OK, TX	OK: "A minimum of 2 learning areas are available outdoors." TX: See sidebar
QRIS contains no requirements relating to outdoor space beyond Environment Rating Scale or Similar	AR, AZ, CA, CO, DE, GA, IA, ID, IL, KY, MA, MS, MT, NC, ND, NV, OH, PA, SC, TN, VA, WA	N/A

Recommended Enhancements to Quality Rating Improvement Systems

Because Environment Rating Scale does not adequately address the outdoor learning environment, QRIS should not depend exclusively on the ERS to evaluate outdoor settings, as is the case in more than 20 states. QRIS should also include the following specific standards:

1. A standard for minimum time outdoors, weather permitting. The Michigan standard of 30 minutes per 3 hours of programming is a minimum standard.
2. At least 75 square feet of outdoor learning space per child.
3. Standards for features of outdoor learning environments including a) number of outdoor learning features, b) number of gross motor activity features, including looping pathways, c) natural features in the outdoor environment that enrich children's play and learning such as: Non-toxic trees, shrubs, or vines; topographic variations (such as mounds, terraces, slopes); a variety of ground surfaces (mulch, grass, pebbles); smooth rocks, wood or logs; non-poisonous flowering plants or garden plants and vegetables; birdfeeders, bird baths and birdhouses.

Wheeled toys and a looping pathway are associated with increases in levels of physical activity

"The children love the trike path and log seating, and building clubhouses with the logs and tree cookies: building, stacking, carrying."

"Our proudest achievement would have to be the discipline improvement. The kids are not all doing the same things as each other, instead they are using their imaginations more."

"There are more ways for disabled children to play and interact with other children, not just watching."

(Comments from early childhood education professionals)

Sidebar: Texas Rising Star Standards Emphasize Nature in the Outdoor Learning Environment
In 2015 Texas Rising Star program guidelines were amended to change the name of the outdoor space from 'playground' to 'outdoor learning environment' and to include the following qualitative elements:

1. Outdoor environment and activities are linked to and reinforce indoor learning.
2. The outdoor environment provides children with the opportunity to care for living things and appreciate nature/beauty such as: Non-toxic trees, shrubs, or vines; topographic variations (such as mounds, terraces, slopes); a variety of ground surfaces (mulch, grass, pebbles); smooth rocks, wood or logs; non-poisonous flowering plants or garden plants and vegetables; birdfeeders, bird baths and birdhouses.
3. Outdoor environment and natural and manufactured equipment/materials, provides partial shade, motivates children to be physically active and engage in active play such as balancing, climbing, crawling, moving, pushing/pulling, riding, walking, and running. Key elements may include: balls, swings, balance beams, climbing structures, tumbling pads, tricycles or riding toys, marching music, jump ropes, space to skip, hop, and roll.
4. Natural outdoor environment supports social emotional development including but not limited to areas that invite social gatherings, tummy time, dramatic play, group games, music and movement, and spaces for quiet and calm activities. Key elements may include: Natural additions such as boulders, tree stumps, sand area and benches, design elements such as stages, platforms, wind chimes, canopies, teepees, gazebos.
5. Outdoor equipment/materials encourage infants to experience the environment through all five senses

Texas Rising Star Standards available at www.twc.state.tx.us/svcs/childcare/texas-rising-star-program-guidelines.pdf last reviewed on 2.13.15)

C. Early Learning Guidelines. Early Learning Guidelines (ELG) are the primary tool used by states to influence the learning and development outcomes produced by early childhood education providers. ELG are voluntary guidelines which specify desired learning and development outcomes for children of a given age. The prevalence of ELG has increase alongside the standards movement in K-12 education, as more attention is paid to K-12 readiness. In 2002 24 states had adopted ELG, but by 2014 56 states and territories had adopted ELG for children in the 3-5 age group. While ELG are not mandatory, virtually every state Quality Rating Improvement System makes reference to them and provides incentives to centers for offering a curriculum aligned with the state ELG. Early Learning Guidelines therefore represent the most robust tool for increasing environmental and nature learning outcomes in early childhood education.

A review of 50 state ELG found a wide variation in approaches to ELG and to environmental education content. The difference most relevant to the concerns of this paper relate to the degree of detail offered in early learning guidelines. Some states offer ELG that specify general outcomes, which typically are descriptions of something a child will have the capacity to *do,* whereas other states identify very specific and detailed learning goals that relate to mastery of content. Almost all state ELG only addressed environmental education in the science domain, missing opportunities to use environment to aid learning about place and community and to advance dispositions to learning such as curiosity, risk-taking, and perseverance. Within the science domain a contrast of the

Washington State and Pennsylvania ELG for science illustrates the disparate approaches to environmental learning content.

In the Washington State ELG, which takes a capacity approach, science outcomes for 4-5 year olds are encompassed in the following list of what a child should be able to do:

- Predict what will happen in science and nature experiences. Consider whether these predictions were right, and explain why or why not.
- Use tools to explore the environment (a magnifying glass, magnets, sifters, etc.).
- Measure sand or water using a variety of containers.
- Use one sense (such as smell) to experience something and make one or two comments to describe this.
- Investigate the properties of things in nature. Begin to understand what various life forms need in order to grow and live.
- Take responsibility in taking care of living things, such as feeding the fish, watering plants, etc.
- Talk about changes in the weather and seasons, using common words, such as rainy and windy.
- Look at where the sun is in the morning, afternoon, evening and night.
- Take walks outside and gather different types of leaves, name colors he/she sees outdoors.
- Participate (with adult direction) in activities to preserve the environment, such as disposing of litter properly, saving paper and cans to be recycled, etc.
  (Source: http://www.del.wa.gov/publications/development/docs/guidelines.pdf)

By contrast Pennsylvania's early learning guidelines offer a robust content approach. The science section alone spans more than 18 pages and has an Environment and Ecology Glossary with 30 terms. The glossary includes terms such as adaptation, aquatic ecosystem, biodiversity, habitat, integrated pest management, non-point pollution, terrestrial system, and watershed. The Pennsylvania ELG contains by far the most detailed environmental content of any state (see https://www.pakeys.org/uploadedContent/Docs/Career%20Development/2014%20Pennsylvania%20Learning%20Standards%20for%20Early%20Childhood%20PreKindergarten.pdf).

There is an active debate on whether a capacity or content approach best serves the child learning and development goals of ECE, depending in large measure on one's view about which approach is developmentally appropriate for a child of a given age. Taking a position on the debate is outside the scope of this review, and readers are directed to the North American Association for Environmental Education's Early Childhood Environmental Education Programs: Guidelines for Excellence, and to National Association for the Education of Young Children's position paper on early learning standards. Readers with a content orientation are encouraged to review the Pennsylvania standards, whereas those with a capacity orientation are encouraged to review the guidelines of Washington State, Montana, or Missouri.

Recommended enhancements to Early Learning Guidelines

1. Use nature and outdoor learning to advance learning goals across all domains, and not just in cognitive and science development.
2. Develop examples of how to use the outdoor learning environment and natural materials to advance each learning goal, following the model of the supplement to the Nebraska Early Learning Guidelines "Connecting Children to Nature."

D. Environment Rating Scale. The Environment Rating Scale (ERS) is an influential national measurement tool to assess process quality in an early childhood care group. There are four environment rating scales, each for a different age groups and settings: infants and toddlers (ITERS-R), early childhood (ECERS-R), family care (FCCERS-R), and school-aged care (SACERS-R), and each scale has items to measure what it considers the three most basic child needs: 1) Protection of their health and safety; 2) Building positive relationships; and 3) Opportunities for stimulation and learning from experience. The ERS is developed by the Frank Porter Graham Child Development Institute at the University of North Carolina at Chapel Hill and is non-binding, but it is the most influential

measurement tool because it has been incorporated by reference by 22 state Quality Rating Improvement Systems, and in most of these cases, the ERS is the only vehicle for evaluating the outdoor environment.

Given the influence of this tool, the Early Childhood Environment Rating Scale-Revised (ECERS-R) was reviewed for content related to outdoor environment. The nature and outdoors content of ECERS-R is modest. Three of 43 items on the measurement scale relate to nature or the outdoor learning environment, and a center could achieve an 'excellent' rating with modest outdoor and natural features. (The term 'environment' as utilized by ERS refers to the total care environment, encompassing indoor and outdoor physical environments, programming content and structure, and interactions.)

Recommended enhancement of ERS

The outdoor learning environment and living and natural items are underutilized resources in ECERS-R. The following environment features should be included in the point scale:
(1) At least 30 minutes outdoors per 3 hours in care, weather permitting
(2) Point scale incentives for outdoor gross motor features
(3) Point scale incentives for outdoor learning stations
(4) Point scale incentives for natural features in the outdoor environment that enrich children's play and learning such as: Non-toxic trees, shrubs, or vines; topographic variations (such as mounds, terraces, slopes); a variety of ground surfaces (mulch, grass, pebbles); smooth rocks, wood or logs; non-poisonous flowering plants or garden plants and vegetables; birdfeeders, bird baths and birdhouses

Fixed logs provide an opportunity for gross motor activities like jumping, climbing, and balancing

"They are learning control and ethics in how they interact with nature: what to pick, what not to pick."

"The garden is a kind of therapy to the children from difficult situations and with special needs."

(Comments from early childhood education teachers)

E. Head Start Performance Standards. Established in 1965, Head Start promotes school readiness for children in low-income families by offering educational, nutritional, health, social, and other services. Head Start operates in every state and serves almost one million children and families, and because of the scale and reach of the program, the Head Start Performance Standards are important indicators of quality in ECE. https://eclkc.ohs.acf.hhs.gov/hslc/data/factsheets/docs/hs-program-fact-sheet-2012.pdf

The performance standards recognize an essential role for outdoor time by establishing minimum outdoor space requirements and requiring time outdoors for play and gross motor development as well as for learning. Each

center must provide "at least 75 square feet of usable outdoor play space per child," (1304.53(a)(5), child physical development must be promoted by 'providing sufficient time, indoor and outdoor space, equipment, materials and adult guidance for active play and movement that support the development of gross motor skills" (1304.21(a)(5)(i)), and a curriculum that "provides individual and small group experiences both indoors and outdoors" (1304.21(c)(1)(vii)).

Recommended enhancements

While the Performance Standards recognize the importance of outdoor time, they could be improved by adding the following specific requirements:
1. A standard for minimum time outdoors, weather permitting, such as 30 minutes outdoors per 3 hours at the center.
2. Standards for features of outdoor learning environments including a) number of outdoor learning features, b) number of gross motor activity features, c) natural features in the outdoor environment that enrich children's play and learning such as: Non-toxic trees, shrubs, or vines; topographic variations (such as mounds, terraces, slopes); a variety of ground surfaces (mulch, grass, pebbles); smooth rocks, wood or logs; non-poisonous flowering plants or garden plants and vegetables; birdfeeders, bird baths and birdhouses.

F. National Association for the Education of Young Children (NAEYC) Early Childhood Program Standards.
The National Association for the Education of Young Children is the leading professional association for ECE providers, and their program standards and accreditation criteria represent best practice in the field. Many state Quality Rating Improvement Systems require NAEYC accreditation in order to achieve the highest rating in their system.

The NAEYC standards make good use of nature and the OLE. The curriculum includes daily indoor and outdoor experiences (2.A.07.b) and children should have the opportunity to learn content such as the difference between living and non-living things, life cycles of various organisms, and about the earth and the sky (2.G.02.a&b). Teaching staff should support children's needs for 'fresh air,' (3.A.03.c) and there should be both an outdoor learning environment with 'a variety of age- and development appropriate materials and equipment' (9.A.04) as well as "outdoor play areas, designed with equipment that is age and developmentally appropriate" (9.B.01) and with at least 75 square feet per child (9.b.04.) The program standards also consider whether walks are undertaken which include exploration of what was encountered(2.D.04.)

Recommendations for enhancement of NAEYC Early Childhood Program Standards are the same as for Head Start Performance Standards.

CALL TO ACTION

In the past 20 years significant strides have been made in increasing public understanding of the benefits of early childhood education and in gaining public support for ECE. With this growing public awareness comes heightened expectations about the ability of ECE to provide children with experiences that improve their health and school readiness. In this context, it is essential that we make use of every low-cost resource that can contribute to these positive outcomes.

A growing body of research indicates that daily time in a rich natural outdoor play and learning environment contributes positively to every desired outcome in ECE—including improvements in cognitive development, social and emotional development, physical activity, and nutrition. But as this review has amply demonstrated, the great number of policy instruments that have been developed to improve the quality of ECE consistently underutilize the outdoor learning environment and nature inquiry.

We call on all ECE policymakers to adopt the following measures across the range of ECE policy instruments to make natural outdoor play and learning environments available to all children:

- Formally designate the outdoor space an outdoor play and learning environment in state licensing regulations
- The outdoor play and learning environment has at least two outdoor gross motor features (e.g., climbing features or looping pathways)
- The outdoor play and learning environment has at least two outdoor learning settings (e.g., gardening area, loose parts station, or dramatic play area)
- The outdoor play and learning environment has a looping pathway and wheeled toys
- The outdoor play and learning environment includes a diverse selection of plants and habitats representative of local flora and fauna
- The outdoor play and learning environment has natural features that enrich children's play and learning such as: non-toxic trees, shrubs, or vines; topographic variations (such as mounds, terraces, slopes); a variety of ground surfaces (mulch, grass, pebbles); smooth rocks, wood or logs; non-poisonous flowering plants or garden plants and vegetables; birdfeeders, bird baths and birdhouses
- At least 30 minutes of outdoor time is offered per three hours at the center
- An outdoor water source for irrigation is available
- Consumption of fruits and vegetables grown on site are expressly allowed
- A nature supplement for early learning guidelines is adopted
- Professional development on creating and utilizing the outdoor play and learning environment is provided
- Each center has outdoor space of at least 75 sq. ft. per child, with exemptions granted only if daily walking outings to nearby parks or public spaces are provided

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