

Growing Up WILD: **Teaching Environmental Education in Early Childhood**

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A growing body of research, both nationally and internationally, indicates that children in the early childhood years (birth to age 8) learn primarily through their senses and from direct experience. They develop an understanding about the world through play, exploration, and creative activities as well as by watching and imitating adults and other children. *Growing Up WILD* (2010) is a large format book that promotes teacher efficacy with 27 developmentally appropriate activities, yet gives educators the flexibility to modify activities to meet the needs of children at different age levels and learning stages. The authors describe the contents of the resource as it presents a wide range of options for a variety of classroom strategies: small group, whole group, centers, pair and individual work, plus teachable moments that encourage child-initiated learning experiences. Activities allow opportunities for learning through play by integrating environmental science with literacy, math, and art. Social, emotional, physical, language, and cognitive domains are involved as students participate in hands-on experiences that are particularly effective in early childhood settings. Included in the article is a summary of activities that align with the NAAEE guidelines for teaching environmental education concepts, as well as the Early Childhood Environmental Education Programs: Guidelines for Excellence, and addresses the Head Start Outcomes.

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International experts concur that this is an important timeframe for learning about environmental science. Karen Hodgkinson, a primary school science teacher in the United Kingdom, suggests "a quality early experience of science in the primary years is the best support for a more in-depth scientific understanding in later years" (Association for Science Education, 2006). Furthermore, Jonathon Porrit, Director of Forum for the Future and Chair of the UK Sustainable Development Commission, states that children with science knowledge can be very effective in helping their parents become aware of their own environmental responsibilities. These ideas support intergenerational learning advocated by the Jane Goodall Institute (2013) that has started *Roots and Shoots* networks in more than 120 countries. Through *Roots and Shoots*, tens of thousands of people from young children to grandparents share their desires to create a better world by identifying problems in their communities and taking action.

Other countries are also experimenting with outdoor environmental projects. One example is "Learning About Soil with Tiptop and His Friends," sponsored by the Technological Research Council of Turkey (TUBITAK) Schools of Nature and Science, with a goal of using group activities that teach concepts related to soil conservation to children between the ages of 5 and 6. The project was comprised of 180 children (90 in the control group and 90 in the experimental group). Results of the study indicated that the soil-related knowledge scores of children in the experimental group of the project increased significantly in comparison to the children in the control group (Ogelman, 2012).

What sparked this interest?

A growing body of research indicates that young children learn in ways that are markedly different than older children and adults (e.g. Pretty et al., 2009). Children in their early childhood years learn primarily through their senses and from direct experience. From birth to five years old, attachment, security, and nurture are most important. The parental sphere of influence is dominant and so relations between authority and the child are vital for children's development. These needs are filled not only by parents but also from interactions with early childhood educators.

Although early memories may begin at birth, during the "second age" of childhood, from 6 to 11 years, children develop more complete memories. These may be woven into continuous narratives such as a story or an account of events. By that age children begin to explore their environment outside the parental sphere of control and develop cognitive capacities. In *Children and Nature Connections*, Charles et al. (2009a) report the importance of reconnecting children to the natural world and state, "Beyond programs and legislation, our ultimate goal is deep cultural change, connecting children to nature, so that they can be happier, healthier and smarter." Some early childhood children are in the social care system and they must also develop attachments to place as well as connections to people. This 'sense of place' can be fostered by learning in nature, an important concept for understanding the methods and theory that support *Growing Up WILD*, the latest book from Project WILD. Furthermore, one of the essential

underpinnings of the NAAEE's early childhood environmental education guidelines is the importance of where one lives. This emphasizes the value in children knowing their own habitat or nature in their local environment.

Growing Up WILD is a large-format teaching resource appropriate for formal and informal settings with young children who are developing their own understanding about the world through play and creative explorations. Twenty-seven activities promote respect for the world and other people and endeavor to form attitudes and habits that young children can follow throughout their lives. This guide is an environmental education book for young children evaluated extensively in the report "Building Capacity for Early Childhood Education with Diverse Audience" (Heimlich & Youngs, 2012). Russo (2001) explains that the rationale behind the project encourages early experiences that can be very powerful in shaping positive attitudes in young people towards the environment. The book supports the NAAEE guidelines for teaching environmental education (2012), as well as the NAAEE's *Early Childhood Environmental Education Programs: Guidelines for Excellence* (2010). It also addresses the Head Start Outcomes (2010).

Growing Up WILD's teaching activities present a wide range of options so that children can work and learn at developmental levels that are individually appropriate. The guide uses a variety of teaching strategies - small group, whole group, centers, pair and individual work, and teachable moments -that allow the teacher to choose what is appropriate for each child and situation. Every activity includes sections to encourage environmental awareness. Because young children are sensory learners, several of the activities involve children directly exploring nature. Knowing this, it is important to note that information provided by adults for children must be done so within the context of hands-on experiences to be impactful in the early years.

These early hands-on experiences make the information that adults wish to impart much more meaningful. Each activity has "Standards and Correlations," "Resources," and "Websites." The book also features "Quick Facts," "Wild Wonderful Words," "Materials and Prep," "Warm Up Procedures" and "Wrap-Up." Richard Louv, in his book *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder* (2008), highly recommends engaging children with nature. The *Growing Up WILD* activities support Louv's reasoning and, importantly, coordinate well with the NAAEE's *Guidelines for Early Childhood Environmental Guidelines for Excellence*.

Beyond the basic lesson plans, special sections include "Take Me Outside," "Healthy Me," "Helping Hands," "Mighty Math," "Home Connections," "Art Projects," "Music and Movement," "Centers and Extensions" and "Snacks." Both child-initiated and teacher-initiated learning experiences give children opportunities to select among rich choices such as learning through play, particularly in the "Take Me Outside" and "Centers & Extensions" components. All of the activities integrate the content areas - literacy, math, science, and the arts - and involve social, emotional, physical, language, and cognitive domains, helping to foster development and learning in all areas. These components of

Growing Up WILD confirm another ECEE essential underpinning that environmental education be integrated and infused in learning rather than a separate activity or “subject.”

Growing Up WILD correlates with NAAEE’s *Environmental Education Materials: Guidelines for Excellence* (2009). This document provides a set of recommendations for developing and selecting environmental education instructional materials including: (1) Fairness and accuracy, (2) Depth, (3) Emphasis on skills building, (4) Action orientation, (5) Instructional orientation, and (6) Usability. Many of these NAAEE recommendations are fulfilled by *Growing Up WILD* and three activities will be described to illustrate the versatility of the book.

The initial highlighted activity is called “First Impressions.” According to Wilson (1996), introductory experiences during the early years of children's lives promote interest in animals and the environment. This activity addresses the NAAEE guidelines (2010) that animals are presented fairly and with accuracy about their habitats. Looking at pictures of animals, children explore their impressions, feelings, and knowledge appropriate for their age. “First Impressions” needs only simple materials using animal cutouts, which are provided. The children indicate their first feelings about animals by holding up a sign that shows a “smiley” face on one side and a “frowny” face on the other side. For example, Native American children may see snakes and eagles in a positive light from their cultural perspective as opposed to some urban children who may fear them. It is important that teachers collect the responses to make a large group graph so that even young children can begin to discuss the results using mathematical language (Florida Department of Education, 2010).

Classification skills are important to nurture during the primary grades for future problem solving and mathematical thinking. An extension for “First Impressions” is to have young children place colored pictures of animals from magazines on a two-column chart to differentiate, for example, pet-store animals from other domestic animals or domestic animals from those that live in the wild. The NAAEE’s early childhood guidelines relate to this activity as it emphasizes authentic experiences. Teachers can bring in live animals such as a rabbit or gerbil. Better yet, go outside to capture a grasshopper in a plastic box with holes allowing children to see this arthropod’s movements from all sides before discussing why we should release this animal back to the wild. This kind of thinking may lead to an organized field trip to the zoo to spark children’s curiosity and questioning. With teacher implementation, “First Impressions” progresses from simple cutouts to recognize animals, to seeing pictures of animals in their habitats, to visiting animals in the zoo or simply in the schoolyard neighborhood.

Three special sections complement “First Impressions.” “Snacks” asks students to put together edible animals such as snakes, spiders, earthworms, and ants-on-a-log. These kinesthetic activities help young children think about the shapes of various animals and discuss body parts such as how many legs. “Helping Hands” inculcates respect when

approaching animals such as pets or wild animals. This focus on manners can extend to empathy for the feelings of the shy child or the bully in the classroom or when reacting to someone who says they are afraid of an animal or situation. "Centers and Extensions" give teachers an opportunity to allow students free choices to pursue an interest in their favorite animal. This may lead to an appreciation and sense of wonder for nature and animals that is important to nurture in young children (Wilson, 1993). This is vital because environmental education in early childhood should be based primarily on free discovery with the key goal of facilitating positive direct experiences in nature.

"First Impressions" can be scaffolded to accommodate a variety of developmental levels of learners through the animal cutout, middle range children with the pictures and discussion. Some students might go on to another activity from *Growing Up WILD*, such as "Ants on Parade" (pp. 12-13). This activity is compatible with "Understanding an Anthill," another developmentally appropriate, child-centered, outdoor exploratory activity that is highlighted in the NAAEE's early childhood environmental education guidelines. Both experiences can include children collecting food for ants, forming hypotheses about their food preferences, and then closely observing and graphing ant behavior. Table 1 correlates "First Impressions" with both Head Start Outcomes and the NAAEE guidelines for environmental education materials, as well as NAAEE's early childhood environmental education guidelines.

A second activity from *Growing Up WILD* is "Oh Deer." The goal of this activity is stated in the section called "Quick Facts." It states, "All animals need food, water, shelter and space. Each species or kind of animal has specific requirements for these survival needs." In this activity the main focus is deer. These herbivores are widespread throughout North America and the world's varied environments such as forests, deserts, plains, swamps, prairies, farmlands and suburban areas. Deer headbands are provided for the students as visual clues associated with the concepts of food, water, and shelter; the essential component space is assumed. After each round of the game, the students count and record on a large classroom graph the number of deer at the beginning and the number of surviving deer at the end of each round. The graph becomes a visual reminder of what they experienced during the activity. This group activity lends itself extremely well to teaching English language learners (ELLs). Children can progress in listening to and understanding English while they play a game explaining deer populations. ELL students may not understand conceptual words like "habitat" right away, but they can compare how many and make sense of the number of deer increasing and decreasing while participating in this group activity. This also helps build a cultural bridge through shared experiences with other children. The learning experiences increase the children's vocabulary as they learn first-hand words such as alive, recycled, and habitat in addition to helping them learn important concepts about animals and the environment (Petrash, 1992).

"Oh Deer" relates to the NAAEE guideline about depth of knowledge as the concept of varying deer populations is learned in the context of a game for children in primary

grades. For younger children the “Take Me Outside” suggestion is for children to imagine they are deer living in their center playground and explore ideas related to their habitat needs. The simple song called “Where’s the Habitat?” has repetitive words to help second language learners imitate animal movement, and allows active early childhood learners to exercise, while they develop understandings of personal space, and reduce stress through rhythmic movement.

The “Healthy Me” special section of “Oh Deer” takes this game to a personal level as students figure out needs in their own habitat. A paper divided into four sections represents their own habitat as they cut out or draw representations of the essential components: food, water, shelter and space. They make a simple drawing of their home, showing their kitchen for food, their bathroom for water, their own bedroom as personal shelter and the living room for common space. This activity is most meaningful and appropriate for primary grad children rather than preschool. Table 2 depicts the various components of this activity.

A third activity from *Growing Up WILD* deals with understanding the needs of a particular animal in its habitat. The “Deep Blue Sea” activity enlarges the idea of the environment to help children who do not live by the ocean experience the concept of salty water. To emphasize how much water on earth is salt water, the teacher tosses a blow-up plastic globe into a circle of children who are instructed to catch it with only two fingers. Once again, the teacher helps students collect data by counting the results of land, fresh water or oceans. This helps the children understand that much of our planet is salt water. The Special Sections “Mighty Math” teaches classification skills when students compare and sort seashells which is an opportunity for young pre-school children to manipulate natural materials. In “Music and Movement” students move as ocean animals to the song “Did You Ever See a Sea Animal?”

As a wrap-up, students create a whole-group collage or mural of the ocean life they might observe during an imaginary sail on the back of a whale. Working with an adult, older students identify the sea animal that they choose to include in the whole class collage and tell others if it was a real or imaginary, and the ocean depth and habitat it prefers. Concepts of number and operations are enhanced when teachers ask students to tell how many sea creatures they found when they finish their collage. Together they can compare, sort, and count the number of different sea animals found by the class as well as estimate how many they think might be in all the oceans on earth.

“Deep Blue Sea” concludes with “Home Connections” which gives parents and guardians ideas to continue the learning with activities such as setting up an aquarium or visiting a pet store. The last suggestion correlates with the NAAEE Guidelines for Action to promote civic responsibility, encouraging learners to use their knowledge, personal skills, and assessments of environmental issues as a basis for action. Table 3 outlines the specifics of this activity, however this activity can be scaled up or down. The youngest children can experience salt and fresh water. Middle range children can become very creative with

their mural; older and gifted children can make full use of the learning resources provided by the aquarium or create their own pet store.

CONCLUSION

The early childhood book *Growing Up WILD* (Council for Environmental Education, 2010), adheres to the founding philosophy of Project Wild to teach children not what to think, but how to think. The activities can help children understand how to handle challenges and problems more successfully, act responsibly toward each other and the earth, be more physically active and aware of their personal needs and those of others, and have a greater appreciation for arts, music, history and literature (Council for Environmental Education, 2010, p. 4). Environmental science experiences promote an appreciation for animals and the environment, as well as enrich vocabulary through beginning literacy and math skills. These suggested experiences in nature and with natural materials help foster young children's curiosity while rooting them in the real natural world. The activities correlate with the Head Start Child Outcomes Framework developed by the U.S. Department of Health and Human Services to identify a framework of domains and indicators for child development. As well, the activities demonstrate the six principles for NAAEE's *Environmental Education Materials: Guidelines for Excellence*. The three *Growing Up WILD* activities highlighted in this article contain a plethora of ideas, concepts and extensions to inspire teachers and their students to continue with further explorations. This program is backed by research from the 2012 Institute for Learning Innovation which undertook a meta-analysis entitled, "Building Capacity of Early Childhood with Diverse Audiences: Growing UP WILD. During the grant period, 1,911 educators were trained and in turn reached 1,220 children directly and many more through the extended training efforts. The research summary stated: "*Growing Up WILD* appears to be a program with an applicable training program using excellent materials that has a strong return on investment."

References

- Association for Science Education. (2006). Focus on... Why science? *Primary Science Review*, 95, 2-4. Retrieved from: <http://www.ase.org.uk/journals/primary-science/>.
- Blachowicz, C., & Obrochta, C. (2005). Vocabulary visits: Virtual field trips for content vocabulary development. *The Reading Teacher*, 59(3), 262-268.
- Butler, A. & Turbill, J. (1984). *Towards a reading-writing classroom*. Portsmouth, NH: Heinemann Educational Books, Inc.
- Charles, C. , Louv, R., Bodner, L. (2009a). A report on the movement to reconnect children to the natural world. Children & Nature Network. Retrieved from <http://www.childrenandnature.org/downloads/CNNMovement2009.pdf>.
- Charles, C. & Senauer, Loge, A. (2009b). Health benefits to children from contact with the outdoors & nature. Children & Nature Network. Retrieved from www.childrenandnature.org/research.
- Charles, C. & Senauer Loge, A. (2012) Annotated Bibliographies of Research and Studies. Children & Nature Network. Retrieved from www.childrenandnature.org/research.
- Council for Environmental Education (2010). *Growing up wild: Exploring nature with young children*. Retrieved from <http://www.projectwild.org/GrowingUpWILD/links.htm>.
- Florida Department of Education. (2010). Next Generation Sunshine State Standards and Common Core State Standards. Retrieved from <http://www.fldoe.org/bii/curriculum/sss/>.
- Head Start Outcomes (2010) Retrieved from <http://eclkc.ohs.acf.hhs.gov/hslc/tta-system/teaching/eecd/assessment/child%20outcomes/revised-child-outcomes.html>.
- Heimlich, J. & Youngs, R. (2012). *Building capacity for early childhood education with diverse audiences: Growing Up WILD Evaluation*. Edgewater, MD: Institute for Learning Innovation.
- Jane Goodall Institute. (2013). Jane Goodall's roots and shoots. Retrieved from <http://rootsandshoots.org/about-us>.

- Louv, R. (2008). *Last child in the woods: Saving our children from nature-deficit disorder*. Chapel Hill, NC: Algonquin Books.
- North American Association for Environmental Education (NAAEE). (2012). *Environmental Education Materials: Guidelines for Excellence*. Washington, DC: Author.
- North American Association for Environmental Education (NAAEE). (2010). *Early Childhood Environmental Education Programs: Guidelines-for-Excellence*. Washington, DC: Author.
- Ogelman, H.G. (2012). Teaching preschool children about nature: A project to provide soil education for children in Turkey. *Early Childhood Education Journal*, 40(3), 177-185.
- Petrash, C. (1992). *Simple environmental activities for young children*. Beltsville, MD: Gryphon House, Inc.
- Pretty, J., Angus, C., Bain, M., Barton, J., Gladwell, V., & Hine, R. (2009). Nature, childhood, health and life pathways. University of Essex. Retrieved from <http://www.essex.ac.uk/ces/occasionalpapers/Nature%20Childhood%20elh%20iCES%20Occ%20Paper%202009-2%20FINAL.pdf>.
- Russo, S. (2001). Promoting attitudes towards environmental education depends on early childhood education. *Investigating*, 17(4) 34-36.
- Wilson, Ruth A. (1993). *Developing a sense of wonder during the early childhood years*. Columbus, OH: Greyden Press.
- Wilson, Ruth A. (1996). Starting Early: Environmental Education during the Early Childhood Years. ED402147, Eric Digest. Retrieved from <http://www.eric.ed.gov/PDFS/ED402147.pdf>.

Table 1
"First Impressions"

Curricular Foci	Head Start Outcomes	Performance Objectives	Descriptions	Special Features	NAAEE Guidelines for EE Materials	Early Childhood EE: Guidelines for Excellence
Language Development	Speaking and Communication	Progresses in abilities to initiate and respond appropriately in conversations and discussions with peers and adults	Discusses real and imaginary animals	"Snacks" discusses healthy food while making design one can eat such as "Ants-on-a-Log."	1. Fairness and accuracy: EE materials should be fair and accurate in describing environmental conditions, problems, and issues, and in reflecting diversity of perspectives on them.	1.2 Focus on education of young children
	Speaking and Communication	Uses increasingly complex and varied spoken vocabulary	Vocabulary and classification		1.3 Openness to inquiry	1.3 Culturally appropriate goals, objectives and practices.
Literacy	Book Knowledge and Appreciation	Shows growing interest and involvement in listening to and discussing a variety of text	Distinguishes real and fictional animals	"Centers and Extension" Library collection of books and poetry	1.1 Factual Accuracy 1.2 Balanced presentation of differing viewpoints and theories	1.1 Focus on nature and the environment.
	Early Writing	Develops understanding that writing is a	Group write a real story and then a		6. Usability: EE materials should be well designed and easy to use.	4.5 Curiosity and questioning

		way of communicating for a variety of purposes	fictional story about the same animal			
Creative Arts	Dramatic Play	Shows creativity and imagination in dramatic play situations	Re-enacts stories of real animals in their habitat		6.5 Accompanied by instruction and support	3.2 Play and role of adults
Approaches to Learning	Initiative and Curiosity	Develops increased ability to make independent choices	Argue why an animal is wild or domestic	“Helping Hands” manner with animals.	1.4 Reflection of diversity	6.4 Planning and implementing environmental education

Table 2
"Oh Deer!"

Curricular Foci	Head Start Outcomes	Performance Objectives	Description	Special Features	NAAEE Guidelines for EE Materials	Early Childhood EE: Guidelines for Excellence
Science	Scientific Knowledge	Expands knowledge of and abilities to observe, describe, and discuss the natural world, and processes.	Plays game using signs for food, water and shelter	"Healthy Me" needs for my healthy environment: Picture of home	2. Depth: EE materials should foster an understanding and appreciation of environmental concepts, conditions, and issues as appropriate for different developmental levels.	5.6 Environmental Sustainability
Language Development	Listening and Understanding	For ELL children, progresses in English comprehension	Plays game with simple rules	"Music and Movement" as students imitate the animal movements	2.2 Concepts in context	4.4 Skills for understanding the environment
Physical Health and Development	Fine Motor Skills	Grows in hand-eye coordination in reproducing shapes and	Wear headbands provided from the		5. Instructional orientation: EE materials should rely on instructional	5.1 Spaces and places to enhance development

		patterns using scissors	student pages		techniques that create effective learning.	
	Gross Motor Skills	Shows increasing levels of proficiency, control, and balance in movement	Move as deer and consider how do larger and smaller animals move	“Take Me Outside” Where students move like a deer in habitat	2.3 Attention to different scales 5.7 Appropriateness for specific learning settings	5.5 Health, safety and risk
Mathematics	Numbers and Operations	Begins to use language to compare numbers of objects with terms such as more, less, r greater than, fewer, and equal to	Counts the number of deer that survive each round of play		3. Emphasis on skills building 4. Action orientation: EE materials should promote civic responsibility 5.8 Assessment	6.6 Assessment and evaluation

Table 3
"The Deep Blue Sea"

Curricular Foci	Head Start Outcomes	Performance Objectives	Description	Special Features	NAAEE Guidelines for EE Materials	Early Childhood EE: Guidelines for Excellence
Science	Scientific Skills and Methods	Develops increased ability to observe and discuss common properties, differences, and comparisons among and between objects and materials	Observing various seashells	"Home Connections" Set up an aquarium or visit a pet store	1. Fairness and accuracy 1.1 Factual accuracy	2.1 Based on research and theory
	Scientific Knowledge	Expands knowledge of their environment	Tastes salty and fresh water	Set up an aquarium at home or visit a pet store	5. Instructional Orientation 5.2 Different ways of Learning	1. Child directed and inquiry-based
Language Development	Listening and Understanding	Demonstrates increasing ability to attend to and understand stories, songs, poems, and conversations.	Poetry extensions		4. Action Orientation 4.2 Self-efficacy	4.5. A personal sense of responsibility and caring
Mathematics	Patterns and Measurement	Shows increasing abilities to match, sort and regroup objects according to one or two attributes such as shape or size.	Sorts shells	"Mighty Math" comparing seashells	2. Depth 2.3 attention to different scales	1.6 Ongoing evaluation and assessment
Creative Arts	Art	Begins to understand and share opinions about artistic products and experiments	Group mural with ocean plants and animals	"Music and Movement" Move to the song "Did you	3. Emphasis on Skill Building 3.1 Critical and Creative thinking	6.5 Fostering Learning

				Ever See a Sea Animal?"		
Approaches to Learning	Engagement and Persistence	Shows growing capacity to maintain concentration over time on a task, questions, set of directions, or interactions despite distractions and interruptions	The mural will take several days time.		4. Action Orientation 4.1 sense of personal stake and responsibility	6.1 Foundations for early childhood environmental education

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