

# Implications

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## Outdoor Environments for Children with Autism and Special Needs

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*In May 2010, Tara Vincenta and Naomi Sachs presented a webinar called “Prescription for Play: Nature-based Learning and Play for Children with Autism and Other Special Needs.” KaBOOM!, a non-profit organization dedicated to saving play for America’s children, sponsored the webinar and this paper is a distillation of that webinar. To view the webinar, visit KaBOOM!’s Hot Topics in Play page (<http://playschool.kaboom.org/series.php?id=1111>). You will need to scroll down, as the webinars are in chronological order.*

### Introduction

In his ground-breaking book, *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder* (2005), Richard Louv makes a case for the value of spontaneous outdoor play and creating a connection with nature during childhood. He cites many positive benefits of frequent outdoor experiences as a part of children’s everyday lives. Positive outdoor experiences can foster happier, healthier, smarter, and more well-adjusted children and can create future stewards of the earth. Environmental psychologists

Rachel and Stephen Kaplan (1989) have linked contact with nature to restored attention, recovery from mental fatigue, and enhanced mental focus. Studies (Faber Taylor, Kuo, and Sullivan, 2001; Kuo & Faber Taylor, 2004) by researchers at the University of Illinois conclude that children with attention deficit disorder (ADD) show a greater ability to focus immediately after spending time in nature. The conclusion by these researchers is that the greener a child’s everyday environment the more manageable their ADD symptoms.

Outdoor play and learning environments for children with autism and special needs should help children have fun in a safe and accepting outdoor setting, connecting them with the restorative benefits of nature while building on skills learned in the classroom. Many children with autism are in highly structured indoor learning environments during their day and may receive great benefits from having meaningful experiences outdoors. Typically, accessibility is the primary design issue addressed when designing outdoor spaces for children with special needs (e.g., Boundless Playground®). However, due to the nature of autism (and other similar conditions), spaces designed for children with these conditions require considerations beyond accessibility.

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Knowledge and a comprehensive understanding of the challenges shared by these children push designers toward a more holistic view of outdoor spaces for all children. Nature-based learning and play spaces can become more universal and inclusive by addressing a variety of issues including sensory, cognitive, visual and auditory impairment, and limited fine and gross motor skills. **This article explores research and design considerations for creating outdoor, nature-based spaces that allow children with autism and other special needs to play and learn at their own comfort level, overcoming common challenges in a safe, fun environment that is equally engaging for any child.**

## What is Autism?

Autism, or Autism Spectrum Disorder (ASD), is a neurological developmental disability that usually appears in the first three years of life and that especially impacts development in areas of social, verbal, and nonverbal communication. According to the Center for Disease Control and Prevention, ASD affects as many as 1 in 110 children (Autism and Developmental Disabilities Monitoring Network Surveillance Year 2006 Principal Investigators, 2009) and is four times more prevalent in boys than in girls (Autism and Developmental Disabilities Monitoring Network Surveillance Year 2000 Principal Investigators, 2002).

Autism is considered a “broad spectrum disorder” in that it affects each individual differently and to varying degrees. People often say, “If you’ve met one person with autism, you’ve met one person with autism,” meaning autism can manifest itself very differently from one individual to another. On one end of the spectrum, people with severe classical autism may be nonverbal, have significant cognitive challenges, be prone to social isolation, and engage in repetitive behaviors such as hand-flapping or rocking. On the other end of the spectrum, individuals with high functioning autism or Asperger’s syndrome may have good language skills,



Gardening activities are a great way to get kids familiar with the different textures and scents of plants in a controlled manner.

above-average intelligence, and a keen interest in particular subjects.

Autism affects the way children perceive and process their world. Though symptoms vary tremendously from person to person, the three main areas affected are social interaction and communication, sensory integration, and repetitive patterns of behavior.

### **Social interaction and communication:**

Forty to fifty percent of children with autism are either completely nonverbal, or, at the very least, have trouble carrying on two-way conversations. They have trouble reading facial expressions or anticipating what someone else might be thinking or feeling. As a result, they have difficulty expressing their needs and are often solitary and detached.

### **Sensory integration:**

Many children with autism also have some form of Sensory Integration Dysfunction (SID), a condition shared by many other children with special needs. This includes a hypo- or hyper-sensitivity to sensory stimuli including sound, sight, smells, tastes, and textures. For example, some children may be hyper-sensitive (over-sensitive) to the texture or feel of fabric on their skin, a pavement surface, or the grass beneath

their feet. On the other end of the spectrum, children may be hypo-sensitive (under-sensitive) to pain and unable to understand how to protect themselves from physical injury.

Another common sensory issue for persons with autism is the inability to filter input from external sources. They experience everything at once — visual stimuli, sounds, and smells, which can become overwhelming. This, coupled with communication and language challenges, can frequently lead to tantrums and “meltdowns.”

### **Repetitive patterns of behavior:**

Restricted, repetitive, and stereotyped behaviors such as hand-flapping, rocking, or head-banging are common in children with autism. They may have a certain order or routine that must be followed in certain circumstances, or they may become fixated on organizing objects.

### **Other common behaviors:**

Other manifestations include being more interested in objects than in other children, preferring to be alone and detached, resistance to change and an attachment or reliance on sameness, an inability to engage in make-believe play, a resistance to being touched or cuddled, and difficulty with fine and gross motor skills.

### **Issues Shared with Other Children with Special Needs**

Many of these conditions, behaviors, or tendencies — particularly motor and neuromuscular challenges; cognitive, sensory, and communication issues; and visual and auditory impairment — are shared with a broader community of children with special needs, including those with Down syndrome, developmental delay, cerebral palsy, spina bifida, sensory disorders, and vision and auditory deficiencies. Some therapies and design interventions can help those with a range of special needs.

### **Common Therapies**

Common therapies, often carried out by family members, teachers, and therapists (occupational, physical, speech and language, and horticultural therapists), include:

- Applied Behavior Analysis
- Floor Time Pivotal Response Training
- Occupational Therapy
- Physical Therapy
- Sensory Integration Therapy
- Speech and Language Therapy
- Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH)

Additional information about common therapies that are used to treat autism and how they are performed can be found through a document linked at the end of this article. Important concepts from these therapies can be extrapolated into the design of outdoor environments.

### **Research on the Role of Nature in Treating Children with Autism**

Early intervention is one of the most important keys to improvement in autism symptoms – one reason why appropriate outdoor learning environments are crucial. All children learn and develop cognitively as well as physically through play, and a growing body of research points to the important role that nature plays in that development. Creating a supportive environment can go a long way in helping children with special needs (and their siblings) experience the world in a meaningful way.

As with any population, the safest and most beneficial outdoor environments and programs for children should be based on research and evidence (i.e., evidence-based design — EBD). Research directly examining the impact of natural play environments on children with autism or other special needs has been minimal. Currently, we must rely on the body of



research and information that does exist including (1) general information about autism and related disorders (such as Sensory Integration Dysfunction); (2) first-hand accounts from people with autism and their caregivers; (3) general information and research on nature-based play and learning for all children; and (4) standard guidelines for playgrounds, including the Americans with Disabilities Act, and other safety considerations.

Post-occupancy evaluations (POEs) would be helpful in determining whether certain design strategies have the desired effect and how they can be applied to the broadest population. At this point, however, there is not enough research or funding to build specifically designed spaces, and thus we have very few spaces to measure whether a design is functioning according to a particular program. Even small-scale interventions, studied systematically, could provide useful information that would inform future design.

## Design Guidelines

In creating outdoor environments for children across the autism spectrum, design considerations must address a broad range of challenges experienced by this population. Because many of these challenges are shared by children with related disorders, the issues faced by a large population of children with special needs can be accommodated with thoughtful, creative, inclusive design.

One goal of these environments should be to help children apply the lessons they learn in the classroom to a real-world environment, providing them with coping skills outside of the classroom. However, heightened sensory issues are one of the most

common challenges for children with ASDs. It can be difficult for them to filter the amount of information coming at them all at once in outdoor, public spaces. Therefore, outdoor environments for this population should be both comfortable and supportive as they encourage skill-building.

Through examination of current available research, reference materials, literature, and personal interviews and observations, Tara Vincenta has developed the following guidelines for consideration when designing outdoor environments for children with ASDs. Many of these ideas can be creatively integrated into existing outdoor play spaces, retrofitting them to be more user friendly to children with ASDs. As with most design guidelines, these should be considered for their appropriateness within the context of a given project and should not be considered “guaranteed” solutions.



Tara Vincenta has developed guidelines for consideration when designing outdoor environments for children with ASDs. This is a plan view of an outdoor environment designed using these guidelines; however, many of these guidelines can be creatively integrated into existing outdoor play spaces.



Outdoor environments for children with autism could include transitions between spaces/activities, orientation maps, and elements of consistency.

- **Select a location that is tranquil and quiet**, with the least amount of distractions possible. Noise from air conditioning compressors, adjacent traffic, and high-pitched or humming noise can be overwhelming.
- **Include 5'-0" minimum height fencing** that cannot be easily climbed to prevent children from straying outside the area's boundaries, ensuring safety and security.
- **Provide smooth, wide pathways and surfaces** to eliminate the feeling of crowding. In addition, smooth non-glare paving provides a proper surface for children with mobility issues and is important for children with ASDs, many of whom are sensitive to textures and bright light.
- **Provide a clear edge along pathways** so that visually-impaired persons are aware of the edge of the path surface.
- **Avoid specifying materials, including toxic plants, that are easily ingested**, as all children at some time explore their world through taste.
- **Provide orientation maps** that illustrate a layout of the garden or play space so users know where they are and what to expect next. Surprises can create anxiety in persons with ASDs.
- **Provide plenty of shade, both with trees and shade structures**, as persons with ASDs are often photosensitive.
- **Provide transitions between spaces/activities** to allow individuals to orient themselves before experiencing something new. Children with ASDs are uncomfortable with change, and providing space between different activities, accompanied by an orientation map, can help them anticipate these changes.
- **Include some elements of consistency** such as a hedge, stone wall, or an element that creates a comforting, predictable pattern.
- **Sequence activities to introduce elements and ideas** slowly and build upon skills and comfort levels.
- **Provide fixed and non-fixed elements** – unpredictable or changeable elements such as furniture locations, for example, can be disconcerting for persons with ASDs. Create a sequence where the fixed element is experienced first for a sense of security, and further on, areas that are changeable to create a challenge that children have the opportunity to overcome.
- **Provide opportunities for increased socialization**, such as gardening, that encourage one-on-one interaction.
- **Provide plenty of visual aids and signage** as up to 50% of persons with ASD are nonverbal. Some children with autism use a picture exchange system (PICT) to aid their communication with family members and teachers. Therefore, in designing outdoor environments, incorporating signage with clear, simple pictures to communicate ideas or intended use of certain play and learning elements is an important consideration. Include Braille for visually impaired persons and sign language skill-building to encourage communication between verbal and nonverbal children.

- **Provide opportunities to overcome sensory issues**, as many persons with ASDs have an over- or under-responsive sensory system and react differently to sounds, textures, or visual stimuli. Gardening activities are a great way to get kids familiar with different textures and scents of plants in a controlled manner.
- **Provide opportunities for exercise and for increasing motor skills, coordination, and balance.** Beyond play structures, consider adding a walk challenge path or exercise loop. Gardening activities help to increase fine and gross motor skills, body awareness, and motion in addition to providing a calming connection to nature.
- **Provide soothing areas** for the user to escape and re-center when overwhelmed, or to watch activities from a distance until comfortable enough to participate —a bamboo tunnel, a low growing tree to hide beneath, or a fence panel with viewing holes.
- **Provide hammocks or hammock swings** for a sense of comfort by being held tightly by something and to be soothed by the swinging motion.
- **Build in challenges** to help generalize skills to a real-world environment. It is important to provide a level of comfort but also to encourage kids to overcome common fears. A simple example of this is to sequence a concept, such as transition areas, so they gradually become shorter, or gradually present more directional options for the user.



Soothing areas and orientation maps can be incorporated into outdoor spaces for children with autism and other special needs.

## Conclusion

Creating thoughtful, engaging outdoor play and learning environments that incorporate these design guidelines gives consideration to the less apparent challenges of a growing population of children on the autism spectrum. By connecting children with each other, nature, and the broader world, we give them an opportunity to have fun, and we provide some relief from rigid classroom and structured therapies in a safe and accepting environment that is engaging for all. As designers of outdoor spaces, it is vital for us to evolve play spaces beyond accessibility and actively integrate these additional concepts and ideas into our designs. With design based on research and existing evidence, we can create outdoor spaces that foster inclusive, nature-based, fun places for all children to enjoy. This can ultimately help children learn that, despite their different abilities, they have more in common with each other than they may have realized.



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- Tara and Naomi's webinar, "Prescription for Play: Nature-based Learning and Play for Children with Autism and Other Special Needs" on the KaBOOM! Website <http://playschool.kaboom.org/series.php?id=1111>
- The Children and Nature Network – <http://www.childrenandnature.org>
- Natural Learning Initiative - <http://www.naturalearning.org>

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**For additional resources related to autism symptoms and therapies and the role of nature in children's learning and development see the list of resources Naomi and Tara created at:**

**<http://www.healinglandscapes.org/blog/?p=2310>**

## Recommended Reading

### On the web

- SOL (Sequential Outdoor Learning) Environment <http://www.solenvironment.org>
- Therapeutic Landscapes Network <http://www.healinglandscapes.org>, especially the Get Out and Play page (<http://www.healinglandscapes.org/related-play.html>)

## About the Authors

Naomi Sachs is founder and director of the Therapeutic Landscapes Network (<http://www.healinglandscapes.org>), a knowledge base and gathering space that provides information, education, and advocacy about gardens, landscapes, and other green spaces that promote health and well-being. She is also principal at Naomi Sachs Design (<http://www.naomisachsdesign.com>), a design and consulting firm with a focus on gardens and other landscapes that facilitate health and well-being. Naomi holds a Masters of Landscape Architecture from the University of California, Berkeley. She has taught, written, and spoken about the restorative benefits of nature throughout the United States and abroad.



Tara Vincenta, founder and principal of award-winning Artemis Landscape Architects, Inc. (<http://www.artemisLA.com>), earned her bachelor's degree in Landscape Architecture from the State University of New York's College of Environmental Science and Forestry and a BS from Syracuse University. She also holds a Certificate of Merit in Healthcare Garden Design from the School of the Chicago Botanical Gardens. As a strong advocate for the use of outdoor landscapes for healing and education,



Tara has designed the award winning SOL Environment concept as a way of addressing the needs of over one million children with autism and their families.

## Related Research Summaries

InformeDesign has many Research Summaries about designing environments for children with special needs and other related topics. This knowledge will be valuable to you as you consider your next design solution and is worth sharing with your clients and collaborators.

“Supportive Classrooms for Children with Autism”  
—*International Journal of Architectural Research*

“Daycare Activity Areas Affect Children’s Play”  
—*Environment and Behavior*

“Health Benefits of Including Nature Within Hospitals”  
—*Journal of Environmental Psychology*

“Universal Design in Children’s Libraries”  
—*Children and Libraries*

“Campuses that Support Students with Disabilities”  
—*The Journal for Vocational Special Needs Education*

“Nature Improves Concentration for Children with ADHD”  
—*Journal of Attention Disorders*

## Images Courtesy of

Naomi Sachs, Naomi Sachs Design (p. 8, top)  
Tara Vincenta, Artemis Landscape Architects (remainder)



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