The ASD Nest Program

The rate of children being diagnosed with autism spectrum disorders (ASD) has risen dramatically, to an estimated 1 in 150 children. Under the Individuals With Disabilities Education Improvement Act of 2004 (IDEA), children with ASD are entitled to a free appropriate public education in the least restrictive environment. To ensure this, school districts are looking for ways to educate children with ASD that address their core challenges in least restrictive settings. The New York City Department of Education developed the ASD Nest Program to facilitate successful learning in an inclusive classroom. Essential to the success of the program are classroom modifications and a variety of strategies designed to meet the specific academic, behavioral, sensory, and social needs of students with ASD.

As reported by the Centers for Disease Control (CDC, 2007) the rate of children being diagnosed with autism spectrum disorders (ASD) has risen dramatically, to an estimated 1 in 150 children. In 2002, educators in the New York City Department of Education—the largest public school district in the country—conducted a study of the growing number of higher functioning students on the autism spectrum attending New York City public schools. Led by District 15 Superintendent Carmen Farina, with support from Dorothy Siegel and Shirley Cohen, the group studied the research findings of the National Research Council's report, *Educating Children with Autism* (Lord & McGee, 2001), which articulated the belief that "education, both directly of children, and of parents and teacher, is currently the primary form of treatment in autism" (p. 12); that is, that the classroom has the potential to be a major vehicle for change for children with ASD. New York group's recommendations formed the foundation of the ASD Nest Program model of inclusive education. Superintendent Farina launched a pilot project in September 2003 to determine the model's feasibility.

The goal of the ASD Nest Program is to help higher functioning children with ASD learn how to function well—academically, behaviorally, and socially—in school and in their community. The idea of a "nest" is a nurturing home that provides structure, support, and services in order to succeed in inclusive settings. There are currently 59 inclusive ASD Nest classrooms from kindergarten to eighth grade serving 235 children with ASD in 15 neighborhood schools (14 elementary schools and 1 middle school) across all areas of New York City. Nest programs typically begin with two kindergarten classes. As Nest children progress through first, second, and higher

A Model for Inclusive Public Education for Students With Autism Spectrum Disorders

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grades, their schools open Nest classes to accommodate them. Eventually, the elementary schools will have one or two Nest classes in every grade from kindergarten through Grade 5.

> **The classroom has the potential to be a major vehicle for change for children with ASD.**

The ASD Nest Program model strives to create, within a grade-appropriate academic framework, a therapeutic environment in which the requisite supports are provided by a transdisciplinary team of specially trained educators and therapists. Essential to the success of the program are a variety of strategies and classroom modifications designed to meet the specific needs of students with ASD.

The ASD Nest Program employs components of evidence-based models,

approaches, and practices as well as promising intervention strategies. One of the models used as a reference point in creating the ASD Nest program was the LEAP preschool (Strain & Bovey, 2008), a nationally validated model that has been replicated at a large number of sites. Integral components in the model (see Cohen & Bleiweiss, 2007) include positive behavior supports (Crimmins, Farrell, Smith, & Bailey, 2007; Durand & Hieneman, 2008) and promising practices such as social stories (Gray, 2000), relationship-based strategies (Gutstein & Sheely, 2002), and other social/cognitive strategies (Myles, 2005; Myles, Trautman, & Schelvan, 2004; Winner, 2005, 2007). Table 1 delineates the key elements of the ASD Nest Program.

The ASD Nest Curriculum

ASD Nest classrooms provide the same grade-level academic curriculum as other classrooms in their schools. In

addition, they utilize selected instructional strategies and behavioral supports (see box, "Basic Instructional Supports") designed especially for children with ASD and other exceptional conditions. The core curriculum of strategies, supports, and tools (see Cohen & Bleiweiss, 2007) implemented in all ASD Nest classrooms was developed by Shirley Cohen in collaboration with Jamie Bleiweiss, Dorothy Siegel,

Basic Instructional Supports

- Daily class schedule
- Visual aids
- Choice-making opportunities
- Role playing
- Peer supports
- Classroom environmental modifications
- "Catch them being good"

Table 1. Key Elements of the ASD Nest Program

Element	Descriptor
Class size	• 12 students in each kindergarten class; 16 students in Grades 1–5 • 4 students with ASD in each class • Two Nest classes per grade
Co-teaching model	• Two classroom teachers, one certified in special education and one certified in general education, plus a cluster special education teacher to support children during special subjects and instructional lunch
Targeted goal areas	• Language and communication, social skills, peer relationships, self-regulation, adaptive behavior
Social development curriculum	• Social development intervention (SDI) provided three to five periods per week
Home-school connection	• Home and school visits before children enter program • Two-way communication notebook • Monthly parent group meetings
Specialized preservice training	• Training on ASD, behavioral theory and applications, and the ASD Nest and SDI curricula provided for teachers and therapists prior to entry into the program • Supervisor training
Teaming	• Team includes all Nest teachers, a speech/language therapist, occupational therapist, and social worker • 90-minute meeting every week to "case conference" individual children, facilitate consistent use of strategies across all settings by teachers and therapists, provide professional development in intervention practices • Principal or assistant principal is an ongoing member of the team and participates in team meetings
Ongoing site support	• A central support team of special educators, autism specialists, behavior specialists, and speech/language therapists provides technical assistance during the first 2 years of the program and as needed after that • Program director and principals meet monthly during first 2 years of the program and as needed after that
Additional learning opportunities	• Bimonthly discipline-specific inservice training for social workers, speech/language therapists, and occupational therapists • Professional workshops with nationally recognized experts

Note. ASD = autism spectrum disorders.

other members of the central support staff, and school program staff.

Basic Instructional Strategies and Supports

A **daily class schedule** is clearly displayed for easy viewing and reference by teachers and students, with individual activity cards moved to a separate column (e.g., "We Did This"), removed, or flipped over once they have been completed. After the first few weeks of the year, the schedule includes a change from what is expected once each week, with children being prepared in advance to expect a surprise (indicated on the schedule by a surprise box or question mark). This avoids reinforcing the need for sameness and encourages cognitive flexibility.

Visual aids supplement or replace verbal directions. Some behavior that may appear to reflect noncompliance is actually a reflection of the student's inability to understand the teacher's questions or directions about a concept or task. Many children with ASD are better at visual processing than auditory processing, and benefit from visual aids such as pictures, words, and drawings. One such visual aid is The *Incredible 5-Point Scale* (Buron & Curtis, 2003), which assigns numbers 1 to 5 to different levels or types of behavior or feelings. The visual connection helps make behavioral expectations more concrete. When the scale is used for voice modulation, for example, number

5 might be listed as an *emergency voice*, number 4 as a *playground voice*, number 3 as a *classroom voice*, and so on. Visual aids also can reduce the need for teachers to constantly repeat classroom rules.

Children in the ASD Nest Program have **frequent opportunities for making choices** throughout the day. This practice serves several purposes, including increasing engagement and decreasing noncompliance—even when the choices are small ones ("What color marker do you want to use?" "Which story do you want to listen to first?"). Choice gives students a feeling that the classroom is their domain as well as the teacher's, and thus is a place where they belong and want to be. There is also evidence to support the value of utilizing preferred interests in increasing task engagement, attention, and the reduction of negative behavior (Boyd, Conroy, Mancil, Nakao, & Alter, 2007).

For many children with ASD, acquiring more appropriate social skills and behavior is a challenging task. Direct instruction alone, or modeling alone or with direct instruction, may be insufficient in helping some children on the spectrum master new behavior. When **role play**, first by

Figure 1. Organization of the Classroom Environment

Many children with ASD have difficulty with sensory processing and are highly susceptible to sensory overload. For this reason, early in the school year ensure that the classroom is not overwhelming:

- Display only those materials that are being used in a lesson or that are needed for ongoing reference. When you are no longer using materials for either one of these purposes, put them out of sight or turn them around so that only a blank surface is visible.

- Use drop cloths to cover shelves holding play items that may be distracting when those items are not to be used.

- Reserve one particular bulletin board or area of the room to display children's work and display only items that are relevant to current learning goals and objectives.

- Be mindful of the child's visual point of view: children should be able to easily view items to be used for reference. Consider the height, size, and distance of the display from where the children using these items sit.

- Clearly demarcate spaces for individual and group work, including learning centers.

- Set off a quiet area with a beanbag chair and tools for self-calming, such as headphones for listening and manipulatives.

- Avoid the clutter that may be created by unnecessary furniture and materials or poorly organized materials.

some mutual interest in each other. Then the adults assess the likelihood that the interaction will be mutually beneficial, with the typical child displaying a helping disposition. The teacher then facilitates the relationship

as peer mentors in specific situations with appropriate guidance.

Recent literature supports the presence of sensory oversensitivity patterns (Hilton, Graver, & LaVesser, 2007; Minshew & Hobson, 2008) as well as underresponsive patterns (Baranek, David, Poe, Stone, & Watson, 2006; Rogers & Ozonoff, 2005) in individuals with ASD. Adults with ASD have provided expert advice on environmental modifications by describing how the environment may overwhelm their sensory systems (Grandin, 1995; Stillman, 2002; Williams, 1994). ASD Nest **classrooms are organized with sensory issues in mind**, particularly in the early part of the school year (see Figure 1). The ASD Nest Program's occupational therapists work in close collaboration with the classroom teachers to create a sensory environment that meets the needs of all children. Examples include modifying the room lighting by using nonfluorescent lights, using only some of the ceiling lights, dimming lights during selected activities, and keeping shades drawn on particularly sunny days; teaching and using the *Incredible 5-Point Scale*

The ASD Nest Program has made me a better principal. In addition to providing a quality education for children on the autism spectrum, the ASD Nest structure has improved the education of all students in my school. The best analogy I can give is this: The Nest program has acted like a big rock that is tossed into a pond. The excellent structures and strategies learned in this program have spread to include the entire school community. From the team meeting structure to the language and strategies of the Nest, we are a better school because of the ASD Nest program!

—Dolores Troy-Quinn, Principal, PS 186, Queens, NY

adults, then by adults with children, and then by two or more children together, is added to the mix, many more children finally "get it."

Peer supports, in the form of peer buddies, are an important feature of the ASD Nest Program. There are 8 to 12 typically developing peers in each ASD Nest class. The first critical step in the process of implementing peer supports is identifying peers who display

by providing multiple opportunities for the children involved to interact (e.g., seating them next to one another, putting them together for paired reading, making them line partners, assigning them jointly to classroom jobs and errands) and by providing either formal training or informal guidance to the typical peer mentor on how to be most useful to his/her partner. Note that some children with ASD can also serve

(Buron & Curtis, 2003) to keep the classroom from becoming very noisy; providing alternative activities during crowded, noisy ones; padding the bottom of chairs, movable furniture, and equipment with felt to minimize loud scraping noises; and priming students for fire drills or loud bells.

ASD Nest staffs provide reinforcement generously throughout the day by making a point to "**catch them being good**," responding to students' positive behavior or attempts to engage in more appropriate behavior. The schools also use classwide reinforcement systems. The basic standard applied to selection of such systems is that they do not have negative components (e.g., nothing earned by a child is ever retracted and no negative feedback is provided). Children do not get crosses for poor behavior; they get checks or stars or something else for doing or attempting to do what is expected.

Individualized Behavior Supports

Children with ASD have very individualized behavior needs that require a differentiated response. The strategies delineated previously represent measures to support learning and prevent behavioral problems; additional strategies (see box, "Individualized Behavior Supports") focus specifically on preventing and dealing with behavior that impedes learning and social relationships.

Priming, or preparing the child in advance for new activities or situations, is important in all programs that include children on the autism spec-

trum, as dealing with new situations is challenging for all such children. However, it is absolutely essential to preventing "meltdowns" in some children with ASD. ASD Nest classrooms use both individual and group priming.

Individual schedules provide children with built-in breaks at particular points of the day or highlight, for children with a strong "need to know," exactly when special individual activities will take place. Individual schedules are faded out when the child feels less anxious about the school environment and his place in it.

In addition to classroom modifications that can be instituted universally, ASD Nest classrooms implement individual **environmental modifications**. For example, a child who is particularly sensitive to light is seated away from where the sun is brightest; dividers or study carrels (or adjusted seat placements) separate the overresponsive child from distractions during more demanding tasks; the child with auditory sensitivities uses headphones to block out loud or disruptive noises or to minimize auditory distractions during tasks that require concentrated attention.

Teachers in ASD Nest classrooms identify and provide **additional movement activities** for children with heightened movement needs, both within and out of the classroom. They also use **adaptive materials and equipment** such as weighted/huggy vests, Sit-o-Disc and other seat cushions, fidget toys, and snacks that require increased chewing supports children with heightened sensory-motor needs.

In the **"break" program and "help" card strategy**, students can use a "help" card if they cannot successfully carry out an assignment or task on their own. They also are taught to monitor their feelings of distress and request a break when they are close to becoming overwhelmed. **Relaxation training** is taught to all students but particular care is taken to teach children with higher stress levels how to engage in individual relaxation activities to prevent impeding behavior.

Social Development Intervention (SDI)

In addition to the core curriculum strategies in the ASD Nest classrooms, the program utilizes a social development intervention (SDI) curriculum that incorporates the concepts and practices described by Gutstein and Sheely (2002) and Winner (2007), along with other social-cognitive approaches. The SDI curriculum was developed over the past 5 years by Susan Brennan, a speech/language pathologist who has been working in the ASD Nest program since the pilot program began in 2003, in collaboration with two ASD Nest teachers, Lauren Hough and Karen Engel (Brennan & Engel, 2007; Brennan & Hough, 2008).

SDI focuses on social communication, social problem solving, social skills, and pragmatic language development, and aims to promote the development of intrinsically motivated social interaction across environments. A focused SDI period of 45 minutes is delivered to the four children in each ASD Nest class five times a week at the kindergarten level and three times a week in the other grades. These SDI focused periods are planned and coordinated by the speech/language therapist, working with the teachers and occupational therapist. The classroom teachers implement SDI curriculum components (see Table 2) to promote generalization.

Initial Outcomes

Program evaluation of the ASD Nest program is ongoing. Initial qualitative and quantitative data provide evidence of an effective program that is addressing parent concerns, with successful academic, social, and behavioral outcomes. In pre- and posttest interviews, 36 parents reported satisfaction with the ASD Nest program, specifically in the areas of (a) addressing problematic behaviors, (b) improving prosocial behaviors, and (c) successful intervention for sensory sensitivities. Teacher ratings of behavior reflected significant changes ($p < .05$) in pre- and posttesting of a small ($n = 31$) cohort, including decreased aggression, increased

Table 2. Key Elements of Social Development Intervention (SDI)

Element	Descriptor	Sample Activity
Experience sharing	SDI promotes engagement and interaction, encouraging students to function in dynamic learning exchanges and social interactions where information is new and the gathering and sharing of information is essential.	*Build a "we-fort"*: Assign roles that together are needed to complete the structure, thereby encouraging communication. As a team activity, name the fort and take a picture to encourage shared memory. Knock it down together.
Language comprehension	SDI addresses how we comprehend language, use it to express ourselves, understand the hidden rules and another's perspective. An intrinsic piece of SDI is an educator's awareness of pragmatic language weaknesses, as well as the educator's own use of language.	*Person of the Week or Friendship Tree* (Winner, 2005): Tell the children to find out as much as they can about a peer. They should collect information throughout the week and put it on the tree or in a "friend file." Encourage information gathering and question asking through indirect prompts (e.g., declarative language, modeling). Use the information to highlight perspective taking.
Problem solving	Throughout the school day, SDI promotes flexibility in problem solving in both academic and social domains. SDI demystifies the problem-solving process, encourages it as a challenge, and makes the goal of problem solving seem attainable.	*Brainstorming:* Present a variation of a familiar project. Some materials will be missing and some will be different. The familiar activity must be completed in one period. Help the children brainstorm three possible solutions and choose one to try out.
Social cognition	*Social cognition or social thinking* allows the student with ASD to use a strength (thinking) to overcome a challenge (social rules). In Grades K–2, we primarily model and encourage social thinking through the use of vocabulary, and we model and highlight situations that require us to think about others. Literature is a great way to model these concepts, incorporating them into character and story discussions. In Grades 3 and up we teach social thinking more directly.	*Social Detective Agency:* Students study photographs, illustrations from familiar literature, and movie clips, collecting clues to make "smart guesses" about what people/characters might be thinking, feeling, and planning. Students learn to interpret nonverbal cues such as eye direction, facial expressions, and body language, and explore how to use this information to make social inferences.
Flexibility/ self-regulation	The student with ASD can be very rigid and inflexible, leading to difficulties solving problems, relating to others, and thinking socially. We incorporate the idea of flexibility and self-regulation into our younger students' days by modeling, using basic flexibility vocabulary, and highlighting. In third grade we introduce Superflex© (Madrigal & Winner, 2008), a flexibility/self-regulation program.	*Identify Your Team of "Unthinkables":* Help the children identify their Unthinkables, the characters that get in the way of being good social thinkers. The Unthinkables are the enemies of Superflex (e.g., Rockbrain, Topic Twistermeister), that we can defeat if we train ourselves to recognize when we are being inflexible and what strategies we need to use to defeat them (Madrigal and Winner, 2008).
Incorporating strengths and preferred interests	SDI makes use of the many strengths and interests of students with ASD. Rather than banning preferred interests from the classroom, we capitalize on them to help organize these interests into a student's thinking.	*Clubhouse:* Provide each child with an individual session with the therapist during which he/she creates a clubhouse based on his or her special interest. The child decides on a password needed to enter the clubhouse, and a game or activity to play. After considering the knowledge and interests of the other students (perspective taking), the child leads the session, with the therapist taking pictures. Students add information to their Friendship Tree or "friend files" to help them think about the other children later.

Note. ASD = autism spectrum disorders.

social initiation, and improved relationships with peers. All students in this cohort demonstrated mastery of academic goals and advanced to the next grade level in an ASD Nest classroom. A more extensive research project is currently underway to systematically examine the impact of the ASD Nest

major service gap in New York City's public school system for higher functioning children on the autism spectrum. In the process, all involved have earned gratitude from families of those children. The success of the ASD Nest Program is due in large part to avoiding a rapid, large-scale expansion of

I'm only now realizing the full value of the Nest program. Through the NEST program, my son developed a level of comfort and dependable friendship with a group of real peers. Without the program this would not be happening; he would be more or less isolated over the summer except for formal camp-type sessions and even within these he might not really interact with other children. He has a sense of belonging that he would not otherwise have. Had he not been in the Nest Program my guess is he would have more or less floated from class to class through the year without necessarily making sustainable connections.

—Joy Messer, Parent of 6th Grade ASD Nest Student

on academic, behavioral, social, and self-regulation abilities.

Final Thoughts

There are many barriers that can impact the implementation of a program like ASD Nest in a large school system. These include funding issues in times of budget cuts that could endanger essential program supports; hiring staff late in the summer so that they do not receive training prior to the beginning of the school year; selecting inappropriate staff; and a lessening of dedication to the core elements of the model. To date, these barriers have been largely avoided or overcome, and the program has been able to fill a

the program; strong support from principals of schools that have incorporated the program; and continuous implementation of new inservice training and support components for staff, administrators, and parents.

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