Models of Best Practice
in the Education of Students with Autism Spectrum Disorders

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Commonly Used Acronyms

AAC	Alternative and Augmentative Communication
ABA	Applied Behavioral Analysis
ADDM	Autism and Developmental Disabilities Monitoring Network
ASD	Autism Spectrum Disorder
AT	Assistive Technology
BIP	Behavioral Intervention Plan
CDC	Centers for Disease Control
DD	Developmental Disabilities
DSM-IV-TR	Diagnostic and Statistical Manual (Fourth Edition, Revised)
FAPE	Free Appropriate Public Education
FBA	Functional Behavioral Assessment
FCT	Functional Communication Training
IDEA	Individuals with Disabilities Education Act (2004)
IEP	Individualized Education Program
IFSP	Individualized Family Service Plan
JA	Joint Attention
LEA	Local Education Agency
LRE	Least Restrictive Environment
MDT	Multidisciplinary Team
NET	Natural Environment Teaching
NOS	Not Otherwise Specified
PDD	Pervasive Developmental Disorder
PECS	Picture Exchange Communication System
PLEP	Present Levels of Educational Performance
PRT	Pivotal Response Training
SEA	State Educational Agency
TEACCH	Treatment and Education of Autistic and Communication related handicapped CHildren
VDOE	Virginia Department of Education

User Guide

Introduction and Purpose of the Models of Best Practice Document

Autism spectrum disorder (ASD) is a complex neurologically-based developmental disorder that affects a person's ability to communicate and interact, both with other people and with their environment. At one time ASD was considered to be a rare condition, but it is now recognized as one of the most common developmental disorders affecting children. Prevalence rates have soared in the past decade. It is now believed to impact 1 in 110 children (Centers for Disease Control and Prevention [CDC], 2009).

The ratio of individuals with a diagnosis of ASD has and will continue to affect educational programs throughout the Commonwealth of Virginia. This increase in numbers of children in Virginia's schools has created a call for educational services and supports that are uniquely suited for those with ASD. It is the aim of the Virginia Department of Education (VDOE) to ensure each student, including those with ASD, reaches his or her full potential. This requires individualized and comprehensive educational programming, rooted in evidence-based practices.

The purpose of the *Models of Best Practice* document is to provide the tools required to consistently meet the multifaceted needs of students with ASD in the educational setting. The document outlines comprehensive information on the array of available research-based strategies and supports. Content will enable teachers and related services staff to identify and implement practices that have the desired effects both on students' short-term functioning and long-term independence.

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Recommended Use of the Models of Best Practice Document

The information presented herein is designed to guide all schools' practices for educating students with ASD and to promote consistency of programming across educational environments throughout the Commonwealth. This document is intended to serve as a resource primarily for educators, but may also be helpful to parents, medical professionals, and other providers when they are making informed choices about the education of students with ASD.

Continuity across autistic disorders allows this document to address both the specific disability category of autism, as well as the more broadly defined group of autism spectrum disorders. Similarly, the information provided may be used across a variety of educational settings from self-contained to general education classrooms.

While this *Models of Best Practice* document addresses students in preschool and elementary school, it is recognized that ASD is a lifelong disability. Components of this document may be applied to students in middle or high school with discretion. Application with older students should be considered individually and incorporate professional judgment and data-based decision-making.

We have organized this document in a progressive manner. Considerations for providing an effective education are provided in a logical and meaningful order to help the professional make informed decisions. We recommend moving through the manual systematically beginning with the first section. This document should be read in its entirety. No section(s) should be read in isolation from the rest of the

document. Some chapters may be perceived as more relevant to some school personnel or more applicable to certain students. However, it is important for school personnel to be familiar with all components of a comprehensive curriculum and all factors that contribute to evidence-based practices for students with ASD.

There are five major sections: Foundational Competencies, Providing an Effective Education, Addressing Interfering Behavior, Collaboration with the Educational Team, and Case Studies. To enhance understanding, examples of students with ASD are provided at the end of this document. Examples offer descriptive accounts of principles and evidence-based practice applied in real situations. Case examples are to be used only to exemplify a point or illustrate a practice and are not to be directly replicated.

Considerations When Using the Models of Best Practice

The *Models of Best Practice* is based on common strengths and core deficits among individuals with ASD. Despite some similarities, there will be much variation among students' abilities and needs. Practices outlined, therefore, are not to be applied uniformly with every student on the spectrum. The adoption of a particular recommendation outlined in this document must be made while considering the unique needs of the student and the present circumstances. The inherently individual nature of ASD, the broad range and combination of abilities, and the legal mandates for individualized instruction necessitate thoughtful, informed consideration in educational programming design. Implementation of evidence-based practice is complex and requires the integration of research with other critical factors. These factors include:

- Student strengths
- Student needs
- Student learning style
- Student values and preferences
- Family values and preferences
- Capacity to accurately implement interventions

This document includes recommendations for assessment and data collection that can generate information needed to make informed decisions.

Implementation of practices should not be an individual decision. Collaboration among educational team members is the key to determine a program that will result in achieving the best student outcomes. Members, which include the individual with ASD, parents, guardians, and other family members, must work together to identify the best strategies and supports and develop a plan that will ensure consistent and effective implementation. This requires ongoing and thorough communication.

Program review and revisions are a core component of educational planning. Frequent evaluation of progress, practices, and implementation is essential. Team members should use data-based decision-making to direct changes to a plan or strategy and return to the *Models of Best Practice* for further information and recommendations.

The contents of this document represent the evidence-based practices available at the time of its creation. Additional information about ASD and the strategies and supports needed to provide an effective education continue to evolve. It is recommended that readers also seek out more recently published information to supplement the information contained within this document.

Implementation of practices should not be an individual decision. Collaboration among educational team members is the key to determine a program that will result in achieving the best student outcomes.

Foundational Competencies

Categories of Autism Spectrum Disorder

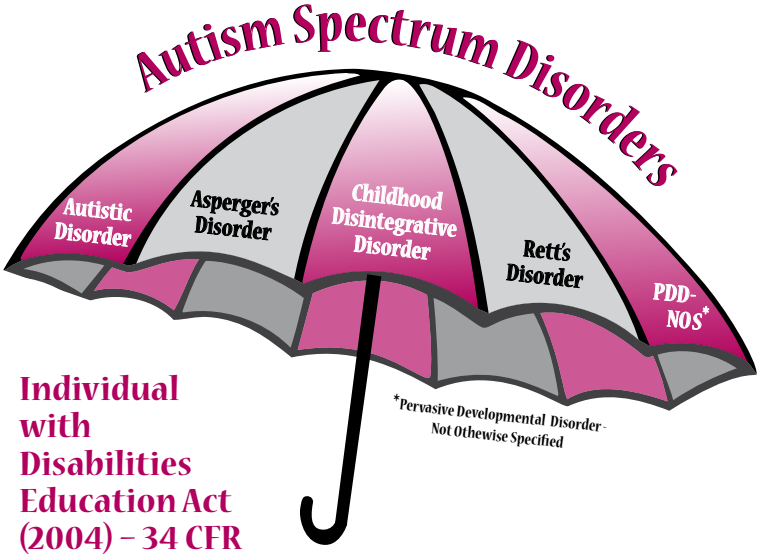
ASD is a descriptive umbrella term that encompasses five different diagnostic categories. They are:

- ✶ Autistic Disorder
- ✶ Asperger's Disorder
- ✶ Pervasive Developmental Disorder - Not Otherwise Specified (PDD-NOS)
- ✶ Rett's Disorder
- ✶ Childhood Disintegrative Disorder (CDD)

Each of the five categories is characterized by impairment in social interactions, deficits in communication, and patterns of restricted or repetitive behavior. Despite similarities in core areas of impact, each category does have unique characteristics and diagnostic criteria. Of the five disorders above, autism, Asperger's Disorder, and PDD-NOS are the most common; therefore, this document focuses primarily on these three categories. Although Rett's Disorder and CDD present differently than the other ASDs, the characteristics and educational concerns are similar to those of students with ASD and may benefit from the same practices.

Educational Definition

It is the Individual with Disabilities Education Act (IDEA, 2004) that provides the federal educational definition of the disorder. This federal law uses the term "autism" to refer to all Autism Spectrum Disorders. Educators use this educational definition when determining whether a student is eligible for special education and should receive such services under the disability category of autism. Using the federal definition as a foundation, states may outline their own definition and establish specific criteria to determine whether a student has autism and should receive special education services under this category.



Individual with Disabilities Education Act (2004) – 34 CFR Part 300.8(c)(1)

Below is the definition of autism provided by IDEA:

(i) Autism means a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three that adversely affects a student's educational performance. Other characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences.

(ii) Autism does not apply if a student's educational performance is adversely affected primarily because the student has an emotional disturbance, as defined in paragraph (c)(4) of this section.

(iii) A student who manifests the characteristics of autism after age three could be identified as having autism if the criteria…of this section are satisfied.

Virginia Special Education Regulations

The definition used by Virginia schools can be found in the *2010 Regulations Governing Special Education Programs for Children with Disabilities in Virginia*. Virginia uses the same definition of autism provided in IDEA (2004) but further delineated specific

criteria for eligibility. Below are the criteria outlined in the Virginia Special Education Regulations:

1. There is an adverse effect on the child's educational performance due to documented characteristics of autism, as outlined in this section; and

2. The child has any of the Pervasive Developmental Disorders, also referenced as autism spectrum disorder, such as Autistic Disorder, Asperger's Disorder, Rett's Disorder, Childhood Disintegrative Disorder, Pervasive Developmental Disorder – Not Otherwise Specified including Atypical Autism as indicated in diagnostic references.
   a. Students with Asperger's Disorder demonstrate the following characteristics:
      (1) Impairments in social interaction, such as marked impairment in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction; failure to develop peer relationships appropriate to developmental level; a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (i.e., by a lack of showing, bringing, or pointing out objects of interest); or lack of social or emotional reciprocity are noted; and
      (2) Restricted repetitive and stereotyped patterns of behavior, interests, and activities such as encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus, apparently inflexible adherence to specific, nonfunctional routines or rituals, stereotyped and repetitive motor mannerisms, persistent preoccupation with parts of objects.
   b. Students with autistic disorder, in addition to the characteristics listed in subdivisions 2 a (1) and 2 a (2) of this subsection, also demonstrate impairments in communication, such as delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime). In individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others, stereotyped and repetitive use of language or idiosyncratic language, or lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level is noted.
   c. Students with Pervasive Developmental Disorder - Not Otherwise Specified or Atypical Autism may display any of the characteristics listed in subdivisions 2 a (1), 2 a (2) and 2 b of this subsection without displaying all of the characteristics associated with either Asperger's Disorder or Autistic Disorder.

Goals of Education and Intervention

At first glance, there may appear to be multiple goals of education. However, there is one absolute target for all students, including those with ASD: Preparation for adulthood. The IDEA was established to ensure all children with disabilities reach this collective goal and are prepared for opportunities in postsecondary education, employment, and independent living.

Considerations regarding skill development designed for current and future success may include different strategies and practices from

There is one absolute target for all students, including those with ASD: Preparation for adulthood.

those provided as a part of the standard curricula. Considerations may also include different learning objectives. Nevertheless, the goal remains the same. Education for students with ASD provides opportunities for acquisition of knowledge and skills that lead to personal independence and social responsibility (IDEA, 2004).

Models of Best Practice

A Basis in Research

Educational interventions must be validated through research and scientific evidence (No Child Left Behind [NCLB], 2001). The terms "scientifically-based research" and "evidence-based practice" are often used interchangeably to describe appropriately validated interventions. The use of evidence-based practices is in the best interest of the student by ensuring educational decisions are based on techniques and procedures proven effective.

The last twenty years have seen an expansion in available educational interventions for students with ASD. Professionals must be knowledgeable of the range of validated practices and must be able to choose and implement appropriately based on the strengths, challenges, and characteristics of a student. Evidence provided by research must be analyzed to make sound programmatic decisions. This requires an ongoing inquiry into the growing body of research available on intervention. Despite the requirement of evidence-based practices, interventions without research support continue to emerge and be used by families and professionals alike. Practices that do not have evidence-based support are not recommended and should only be used with extreme caution as they have the potential to prohibit the ability of a student to reach his or her maximum potential.

Definition of Evidence-based Practice

According to IDEA (2004) and federal and state regulations, scientifically-based research means research that involves the application of rigorous, systematic, and objective procedures to obtain reliable and valid knowledge relevant to educational activities, programs, and strategies. Scientifically-based research:

- ✶ Employs systematic, empirical methods that draw on observation or experiment;
- ✶ Involves rigorous data analyses that are adequate to test the stated hypotheses and justify the general conclusions drawn;
- ✶ Relies on measurements or observational methods that provide reliable and valid data across evaluators and observers, across multiple measurements and observations, and across studies by the same or different investigators;
- ✶ Is evaluated using experimental or quasi-experimental designs in which individuals, entities, programs, or activities are assigned to different conditions and with appropriate controls to evaluate the effects of the condition of interest, with a preference for "random-assignment" experiments, or other designs to the extent that those designs contain "within-condition" or "across-condition" controls;
- ✶ Ensures that experimental studies are presented in sufficient detail and clarity to allow for replication or, at a minimum, offer the opportunity to build systematically on their findings; and
- ✶ Has been accepted by a peer-reviewed journal or approved by a panel of independent experts through a comparably rigorous, objective, and scientific review.

In accordance with federal regulations and thorough analysis of peer-reviewed literature and publications, the National Professional Development Center on Autism Spectrum Disorders (NPDC-ASD) developed a formal definition for evidence-based practices. This definition is based on rigorous criteria and is widely accepted as a comprehensive definition to identify effective practices.

The NPDC defines evidence-based practices for individuals with ASD as those practices for which efficacy is established through peer-reviewed research in scientific journals using one of the following:

- **Randomized or quasi-experimental design studies**: Two high quality experimental or quasi-experimental group design studies
  - High quality randomized or quasi-experimental design studies do not have critical design flaws that create confounds to the studies, and design features allow readers/consumers to rule out competing hypotheses for study findings.

- **Single-subject design studies**: Three different investigators or research groups must have conducted five high quality single subject design studies
  - High quality in single subject design studies is reflected by a) the absence of critical design flaws that create confounds and b) the demonstration of experimental control at least three times in each study.

- **Combination of evidence**: One high quality randomized or quasi-experimental group design study and three high quality single subject design studies conducted by at least three different investigators or research groups (across the group and single subject design studies).

Research Design and Publication

To be considered evidence-based, research must go through an objective and scientific review. It is often published in a peer-reviewed journal or publication. Peer-reviewed literature (also known as refereed literature) is scholarly work that generally represents high-quality original research in the field. Prior to publication, the literature is subject to a screening process by the journal based on predetermined standards of quality. Next, the article is reviewed by peer-reviewers who have expertise in the area of research. If accepted for publication, the manuscript is considered to be high-quality evidence. Several of the current peer-reviewed journals in the field of ASD include: Focus on Autism and Other Developmental Disabilities, Journal on Autism and Developmental Disabilities, Research in Autism Journal of Early Intervention.

Knowledge of research methodology is important for examining the quality of research studies. According to Mitchell and Jolley (2007), the most common types of educational research methodologies include:

(1) **Experimental or Quasi-experimental Group Designs** are used to examine the effectiveness of a particular intervention (or combination of interventions) on a group of students. In these types of designs, the intervention is delivered to a group of students with similar characteristics and traits. Pre- and post-test measurement occurs to determine the effectiveness (or outcome) of the intervention. These results are then compared to the results of another group of students with similar characteristics and traits who did not receive the intervention or may have received a different intervention. Participants are randomly assigned across the two groups in an experimental group design study; whereas, in quasi-experimental group designs randomization does not occur.

(2) **Single Subject Designs** are experimental designs in which a participant analysis occurs (i.e., the individual participant serves as his/her own group) rather than using a between group comparison to examine the effectiveness of an intervention, Using a deductive reasoning approach, single subject design methodology begins with an experimental analysis of an intervention on a single or small group of participants and through systematic replication increases the applicability of the intervention to a larger group of participants. Evaluating the effectiveness of the intervention occurs through repeated measurement of observable behaviors in the presence and absence of the intervention. An additional component of single subject design methodology is the evaluation of the acceptability or social validity of an intervention.

(3) **Correlational Designs** are quantitative research designs, but differ from experimental research methodology in that causal relationships between the dependent and independent variables cannot be inferred. In correlational design methodology, randomized assignment of two groups does not occur. Rather, analyses are conducted that determine the "degree" of the relationship in which the changes in the dependent measure(s) are influenced by the intervention. Analyses used include multiple regression, hierarchical linear modeling and structural equation modeling. Although correlational designs are a critical part of research, unfortunately, they cannot be utilized to determine a causal relationship between changes in the behavior as a result of the intervention. They can; however, be used to identify (or explain) mediating or moderating variables that may influence individuals' responsiveness to various interventions.

(4) **Qualitative Designs** include various research methodologies (e.g., case study, ethnography, action research) that can be systematically employed to help researchers understand the qualities of a particular intervention (or research area of interest). Qualitative research is considered a type of scientific research in that data is generated through various methods (e.g., interviews, focus groups, etc.) to obtain empirical findings. However, the overall purpose of qualitative designs is different than other research methodologies. In general, qualitative research designs are not typically used to document the effectiveness of an intervention; but rather, to examine variables, such as the social validity or other factors that influence the effectiveness of that intervention.

Using a Multimodal Approach

All students with ASD are unique individuals. Characteristics and challenges vary considerably across children. These variations within the disorder have significant implications on educational strategies. Current research supports the use of a multimodal approach to intervention (National Autism Center [NAC], 2009; National Research Council [NRC], 2001; Simpson, 2005). There is no single method that will be successful for all students with ASD. Further, the disorder impacts many areas of functioning; therefore, multiple methods will be required to serve just one student effectively. The most successful programs incorporate a variety of objectively verified practices to address the multitude of needs of the student. Interventions should vary considerably based on individual characteristics, strengths, needs, and learning styles.

There is no single method that will be successful for all students with ASD.

Sources

An extensive body of literature is now available outlining comprehensive information regarding educational practices, supports, and processes that are successful for students with ASD. Statutes, case laws, regulations, and policies provide a framework for expectations in goals and development of individualized programming. Peer-reviewed educational, medical, and psychological literature informs recommended practices and supports.

The abundance of information on approaches for this population can be confusing and even conflicting at times. Recently, the literature related to ASD has provided comprehensive reviews of current research to determine whether a strategy or program is effective. These reviews have brought clarity to the discussion as they have identified the level of scientific evidence available for various supports and strategies and have provided specific information about the skills and age groups to which these strategies have successfully been applied. Such research efforts have been utilized to create this document and direct educational components and considerations. Comprehensive sources include, but are not limited to:

Simpson, R. L. (2005). Evidence-based practices and students with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities,* 20(3), 140-149.

National Research Council. (2001). *Educating children with autism.* Committee on Educational Interventions for Children with Autism. Division of Behavioral and Social Sciences and Autism. Washington, DC: National Academy Press.

Iovannone, R., Dunlap, G., Huber, H., Kincaid, D. (2003). Effective Educational Practices for Students with Autism Spectrum Disorders. *Focus on Autism and Other Developmental Disabilities,* 18(3): 150-165.

National Professional Development Center on Autism Spectrum Disorders (NPDC-ASD). Evidence-Based Practices. Available at: ***http://autismpdc.fpg.unc.edu/content/evidence-based-practices***

National Autism Center (2009). Evidence-Based Practice and Autism in the Schools: A Guide to Providing Appropriate Interventions to Students with Autism Spectrum Disorders. Available at: ***http://www.nationalautismcenter.org/pdf/NAC%20Ed%20Manual_FINAL.pdf***

Council for Exceptional Children. (2009). What every special educator must know: The international standards for the preparation and certification of special education teachers. Content Standards for Special Education Teachers of Individuals with Exceptional Learning Needs with Developmental Disabilities and/or Autism (6th Ed.)

Components of a Comprehensive Curriculum

Definition of Curriculum

Curriculum is an organized program of instruction designed by a team of professionals that responds to the changing needs of an individual and supports growth toward independence and lifelong learning. Considerations of the curriculum involve much more than what to teach. Comprehensive curricula include the following:

- Focus Areas for Intervention
- Environment
- Structure and Support
- Assessment Frameworks
- Goal Development and Prioritization
- Instructional Strategies
- Instructional Format

Curriculum Considerations for the Student with ASD

Curricula considerations include both what is taught and how it is taught. For the student with ASD, curricula considerations are especially important. Due to the distinctive learning style and challenges related to communication, social skills, sensory needs, and behavior, a program must provide the positive supports necessary to ensure goals are met. Curricular elements must match individual needs, ensure motivation is high, learning rate is maximized, and behavior is stable.

The upcoming section describes the different elements of the curriculum and how each should be designed. It includes an explanation of the unique characteristics associated with the disorder and considerations for creating effective learning environments. Each element is defined and includes an outline of specific techniques and components, as well as application of the information to teaching situations through case examples. This section is best used in conjunction with the rest of the document as the cumulative information enables the professional to create a comprehensive educational program.

Due to the distinctive learning style and challenges related to communication, social skills, sensory needs, and behavior, a program must provide the positive supports necessary to ensure goals are met.

Providing an Effective Education

Understanding Autism and Autism Spectrum Disorders

To provide an effective educational program, it is first necessary to understand the nature of the disorder and characteristics commonly associated. ASD encompasses an extremely broad continuum of features in individual students (Anzalone & Williamson, 2000). This results in learning characteristics that differ widely from typical students as well as students with other types of disabilities (Simpson, 2005).

Primary Characteristics

ASDs are a group of complex neurological developmental disabilities. It is believed to be a chronic, lifelong disorder with no definitive etiology or cure (Lord & Volkmar, 2002). There are three primary characteristics associated with the disorder: Impairment in social interaction; impairment in communication; and the presence of restricted, repetitive, and stereotypical patterns of behavior. ASD is a "spectrum disorder" meaning that although similar symptoms are shared, each person is affected in different ways. Symptoms can occur in any combination and can range from very mild to quite severe.

Below is a list of challenges associated with the three primary characteristics:

- **Social Interaction:**
  - Relating to people and social / emotional reciprocity
  - Developing and maintaining relationships
  - Demonstrating appropriate social interactions
  - Using and understanding nonverbal forms of communication
  - Expressing and regulating emotions

- Demonstrating appropriate or functional play / leisure skills
- Engaging in imaginative activities
- Understanding and following social rules and norms

✶ **Communication:**
- Understanding others' verbal and nonverbal language and communicative attempts (receptive language)
- Using verbal language / speech
- Using communication for a variety of purposes or functions (e.g., request, comment, question, converse)
- Demonstrating appropriate speech patterns
- Expanding language beyond rote words or phrases
- Modulating vocal intonations or volume
- Understanding language and vocabulary
- Introducing, maintaining, ending a conversation

✶ **Restricted, Repetitive, and Stereotypical Patterns of Behavior:**
- Demonstrating stereotyped and repetitive movements with body or objects
- Demonstrating distress over changes
- Insisting on following routines
- Demonstrating extreme preoccupation with an object or topic of interest
- Demonstrating repetitive and restricted play or leisure activities

Secondary Characteristics

In addition to the primary characteristics, a number of secondary characteristics have been identified and are common in this group. Below is a list and brief description of other areas in which challenges may also be seen and which represent secondary characteristics of individuals with ASD:

✶ **Imitation:** Imitating gross, fine and/or oral motor movements as well as verbal patterns may be delayed or absent. If imitation skills are present, there may be difficulty using skills appropriately in context or generalizing to new or novel situations.

✶ **Theory of Mind:** The individual may have impairment in understanding the way other people think or feel (Baron-Cohen & Swettenham, 1997). They may understand simple causes of feelings and emotions, but have difficulty understanding more complex causes. This often results in not comprehending reasons for behavior or actions of others.

✶ **Executive Functioning:** Skills related to planning and executing actions may be a challenge. Especially problematic is completing activities which require multiple steps. Also present is impairment in controlling behavior as well as self-regulation and response inhibition. Impulsivity is often common.

✶ **Motor:** The individual may have difficulty performing gross and/or fine motor activities. There may be impairment in balance and coordination (Ming, Brimacombe, & Wagner, 2007).

✶ **Sensory:** Hyper- or hypo-sensitivity to sensory stimulation may be present. Sensory abnormalities may occur in any of the seven sensory systems which include visual, auditory, gustatory, olfactory, tactile, proprioceptive, and vestibular systems (Rogers & Ozonoff, 2005).

Learning Characteristics

The significant neurological symptoms of ASD clearly impact how individuals think and learn (Ritvo, 2005). Cognition involves the perception, processing, acquisition, retrieval, transformation, use and exchange of information. Cognitive

ability varies considerably from person to person resulting in patterns of strengths and weaknesses in a student's academic performance as well as communication, social interaction, and behavior. Development of cognitive skills is likely to be uneven (Verte, Geurts, Roeyers, Oosterlaan, Sergeant, 2006). There may be deficits in many cognitive functions or few may be affected. In addition, there may be deficits in complex abilities, yet the simpler abilities in the same area may be intact. Similarly, an individual may display a relative strength in one skill area (splinter skill) which results in overestimation of overall skills. Such diversity in cognition and learning abilities requires teams to make individual decisions regarding educational programming.

Current research identifies the following cognitive features associated with ASD:

- **Attention:** The individual often has difficulty paying attention to relevant cues or information in their environment. Attention may be focused on only a restricted part of the information or environment, to the exclusion of what is relevant.

- **Abstract Thinking:** Understanding information not presented visually or in a concrete fashion may be a challenge. The individual may have difficulty with figurative language including the use of humor, idioms, and sarcasm.

- **Information Organization:** Information is often not organized and analyzed in a meaningful way (Williams, Goldstein, Carpenter, Minshew, 2005). This results in difficulty retrieving information effectively and efficiently. Deficits in this area may impair the ability to make choices, problem solve, and relate information from one experience to another.

- **Information Processing / Comprehension:** Information is often not processed efficiently or reliably. There may be difficulty comprehending oral and/or written information—for example, following directions or understanding what is read. The individual may at times appear to be deaf or demonstrate delays or inconsistencies in responding. Following multiple-step directions is especially challenging.

- **Concept Formulation:** Formulation of ideas generalized from the qualities and relations of objects, events, or ideas may be impaired (Losh, Adolphs, Poe, Couture, Penn, Baranek, & Piven, 2009). Categorization, the core component of concept formation, may be a challenge. The person may be able to classify simple objects but have difficulty understanding more complex groupings.

Strengths

As noted above, the cognitive characteristics present may result in patterns of strengths. These abilities and aptitudes can be used to determine curricula content by guiding both what to teach and how to teach. Using a student's strengths to provide intervention will maximize learning. Building and developing such strengths will increase personal independence and improve outcomes (Janzen, 2003).

Below is a list of common strengths present in those with ASD and a brief description of each:

- **Memory:** Information, both relevant and irrelevant, may be remembered for long periods of time. Small details may be easily recalled. Chunks of information are often stored together and may be used functionally to perform tasks and complete activities.

Using a student's strengths to provide intervention will maximize learning. Building and developing such strengths will increase personal independence and improve outcomes (Janzen, 2003).

- **Visual Processing:** The individual may be able to demonstrate intense focus on visual details. Visual information is often readily understood and applied meaningfully. Presentation of information visually may help compensate for attention and auditory processing difficulties.

- **Intense Focus:** There may be a strong ability to concentrate on information, an activity, or topics for extended periods of time. This may be especially true if it is an activity or topic of specific interest.

Comorbid Disorders

Many individuals with ASD are also affected by comorbid disorders or associated conditions. To provide an appropriate and effective education, understanding the whole person, including any other disorders or conditions is essential. Presence of comorbid disorders often requires additional supports. It may also require the educational team to consider whether the student has educational needs requiring services under an additional disability category.

Comorbid disorders may be medical or psychiatric and may or may not receive an official medical diagnosis. Some present from an early age while others develop over time. Onset during puberty is common. Frequently reported comorbid disorders include:

- Anxiety
- Depression
- Attention Difficulties
- Bipolar Disorder
- Obsessive Compulsive Disorder

Common Medical Conditions

Some individuals may have medical conditions which impact health and functioning. Further, some receive medications to address various symptoms such as attending, hyperactivity, or heightened anxiety. Awareness of health related issues, medications, and potential side effects will help the educator provide a more effective education and ensure safety of the student. Medical conditions documented in individuals with ASD include:

- Seizures and epilepsy
- Chronic otitis media
- Chronic gastrointestinal problems
- Sleep issues

Focus Areas for Educational Intervention

Determining what to teach can be a daunting task. The preceding section outlined the tremendous impact ASD has on functioning. Intervention will likely address the core characteristics of the disorder but may also target other areas if the student is to acquire knowledge and skills that support independence, social responsibility, and community integration. Because no two students have the same strengths and needs, each will require an individualized program.

Skill selection should be based on each student's current abilities and determined through rigorous assessment practices. This will be an ongoing process that will need to adjust based on the needs of the student as he or she grows both in age and abilities. The assessment process is described in detail later in this document. In this section, the potential focus areas for educational intervention are discussed. When educating a student with ASD, the professional should consider each carefully to determine whether the student requires targeted intervention in the domain to ensure provision of a comprehensive educational program.

The list below is not comprehensive nor are skills arranged in the order to be taught. The list is not intended to be a scope and sequence of skills to teach, but instead is designed to be a resource to assist planning. Discrete skills are listed but each is complex with an array of applications for any student. What is taught, how it is taught, and the order in which skills are targeted will vary from student to student. Functional application is essential.

Social Development and Peer Interaction

Characteristics of Social Development and Peer Interaction:

Students with ASD demonstrate qualitative differences in social interaction and often have difficulty establishing relationships. Social ability ranges from being socially aloof, to being socially remote, to being overly social but inappropriate or odd. The difficulties demonstrated with social functioning should not be assumed to be due to a lack of interest or unwillingness to interact with others; ineffective interactions may result from an inability to distill social information from the situation and a deficiency or absence of appropriate skills to respond (Wong, Kasari, Freeman, & Paparella, 2007). Individuals may not notice important social cues and may miss necessary environmental or personal information needed to be successful.

Instructional Focus Areas:

- Joint attention
  - Orient, attend, and respond to adult and peer activities
  - Initiate social attention with adult and peer
  - Maintain attention with joint object
  - Draw attention to an object for purpose of sharing the experience

- Nonverbal interaction
  - Display nonverbal social cues
    - Eye contact
    - Gestures
    - Facial expression
    - Body orientation
    - Proximity
  - Interpret nonverbal social cues

- Emotional understanding
  - Recognize facial expressions
  - Recognize emotional states in self and others
  - Recognize conditions which elicit emotional states

- Self-regulation
  - Identify emotional state
  - Determine the nature of the emotional state (positive or negative emotion)
  - Determine the intensity of emotional state
  - Select and implement appropriate coping strategy

- Social interactions and social reciprocity
  - Recognize social cues and initiations
  - Respond to social cues and initiations
  - Initiate interactions
  - Maintain back and forth interaction
  - Turn take with concrete games and activities, including waiting turns appropriately
  - Turn take with conversation

- Emotional reciprocity
  - Identify emotional states in others
  - Identify antecedents of emotional states
  - Regulate emotional response
  - Offer comfort or gesture of empathy
  - Help others

- Relationships
  - Engage and interact with family members
  - Engage and interact with adults
  - Engage and interact with peers
  - Develop friendships

- Group / Activity participation
  - Share
    - Space
    - Materials
  - Attend to others
  - Listen
  - Wait
  - Turn take
  - Follow group directions
  - Identify and follow social rules, norms, and values

- Identify and respect the social hierarchy

✶ Perspective taking / Theory of mind
- Interpret environmental cues
- Interpret personal cues
- Interpret emotional responses
- Recognize presence of multiple beliefs and perspectives
- Recognize accidental behavior
- Recognize false beliefs / fantasy / fiction
- Recognize deception
- Adjust own behavior to accommodate the situation

Communication

Characteristics of Communication:

All people with ASD experience language and communication difficulties, although there are considerable differences in abilities among individuals. Impairment is present in both understanding and use of communication. Communication skills can range from nonverbal, gestural, use of single words, use of phrases, all the way to fluid speech and language. For some with Asperger's Disorder, language skills can even be advanced. Those with extensive language generally have deficits in the area of pragmatics which is the use of social language (Twachtman-Cullen, 2000).

Instructional Focus Areas:

✶ Motivation to communicate
- Communicate regarding personal needs and interests
- Communicate regarding social interests

✶ Function
- Respond to name
- Follow instructions
- Terminate
- Protest
- Negate
- Gain assistance
- Gain attention
- Greet
- Label
- Expand use and understanding of vocabulary
  - Nouns
  - Verbs
  - Descriptors (adjectives)
  - Functions
  - Features
  - Classifications
  - Pronouns (e.g., personal, possessive, demonstrative)
  - Prepositions
  - Comparatives (e.g., bigger) and Superlatives (e.g., biggest)
  - Adverbs
  - Multiple meanings
  - Figurative language
- Comment
- Yes / No
  - Preferences
  - Factual
- Assert rights or opinions
- Share feelings, ideas, thoughts
- Answer questions
- Gain information
- Ask questions
- Relate information
- Make prosocial statements

✶ Means of communication / Form
- Interpret and use nonverbal communication measures
  - Eye contact
  - Gestures
  - Facial expression
  - Body orientation
  - Proximity
- Interpret and use spoken language
  - Vocalizations (voice without conventional words)
  - Verbalizations
  - Words
  - Phrases
  - Sentences

- AAC
  - Communicate / supplement communication through sign language
  - Communicate / supplement communication through object exchange
  - Communicate / supplement communication through picture exchange
  - Communicate / supplement communication through written text
  - Communicate / supplement communication through electronic device
  - Communicate / supplement communication through computer device

- Conversational skills
  - Respond
  - Initiate
  - Maintain
  - Repair
  - Terminate
  - Converse on topic of interest
  - Converse on multiple topics

- Voice quality
  - Demonstrate verbal fluency
  - Demonstrate volume appropriate to situation and modulate
  - Demonstrate appropriate prosody

- Pragmatic communication
  - Follow social rules of communication
  - Turn take
  - Interrupt properly
  - Select appropriate topic
  - Provide feedback to partner
  - Use appropriate utterance length
  - Use conversational nuances (slang, metaphors, sayings)

Play and Leisure

Characteristics of Play and Leisure:

Purposeful play, recreation and leisure – the ways in which we spend our personal time and develop interests that result in relationships and employment choices – may not naturally occur. Deficits in communication and imagination and the presence of interfering behavior often inhibit productive play (Rao, Beidel, & Murray, 2008). Instead of playing with toys in imaginative or symbolic ways, they may perseverate on objects, use them for self-stimulation, or engage in repetitive acts. Social play is limited as they may not seek peer interaction or may be excluded from peer activities.

Instructional Focus Areas:

- Toy / activity play skills
  - Engage in exploratory play (e.g., sandbox, cause-and-effect)
  - Engage in constructive play (e.g., blocks, train tracks, models)
  - Engage in music activities (e.g., singing, instruments, iPOD)
  - Engage in literacy activities (e.g., books, computer)
  - Engage in pretend / dramatic play (e.g., dress up, doll play)
  - Engage in games

- Social play
  - Engage in isolated play
  - Engage in parallel play
  - Engage in interactive / cooperative play

Activities of Daily Living

Characteristics of Activities of Daily Living:

Activities of daily living refer to personal care activities necessary for everyday living. Although the range of skills can be defined more or less broadly, virtually all categorizations include a focus on self-care skills related to basic biological functions and include such activities as eating and toileting. Other

activities pertain to personal, home and community living skills, with applicable areas for young children including dressing, grooming, cleaning up, and safety-related behaviors. Impairment in activities of daily living may be present in any student with ASD regardless of ability. For example, the seven-year-old student with autism may not sit at a table to eat, while the seven-year-old with Asperger's Disorder may have difficulty spearing food with a fork.

Instructional Focus Areas:

- Toileting
  - Urinate and defecate in toilet
  - Use toilet tissue
  - Request to use the bathroom
  - Complete toileting routine independently
  - Use appropriate behavior in bathroom, such as closing the door on a stall
- Personal hygiene
  - Brush teeth
  - Wash hands
  - Wash self
  - Groom self
  - Comb/brush hair
- Dressing
  - Manage jacket / coat
  - Manage shirt
  - Manage socks
  - Manage pants
  - Manage shoes
  - Manage fasteners (buttons, zippers, snaps, buckles, clasps)
  - Tie shoes
  - Adjust clothing as needed
- Eating
  - Feed self
  - Sit at table for duration of meal / snack
  - Drink from open rimmed cup
  - Eat with spoon, proper handling, scooping
  - Eat with fork, spearing different textures
  - Use napkin
  - Eat variety of foods
  - Prepare simple snack
  - Eat neatly
  - Clean up after meal
- Schedules
  - Follow schedule
  - Follow visual sequence
  - Accept changes in routines / schedules
- School, home, and community independence
  - Navigate settings safely and effectively
  - Complete routines
  - Manage, prepare, and organize materials
  - Complete tasks independently
  - Stay in seat for appropriate periods of time
  - Clean up
  - Put away personal possessions
  - Follows rules designated for the setting
  - Wait
  - Turn take
  - Display appropriate behavior in car / on bus
  - Demonstrate appropriate bathroom behavior
  - Display appropriate behavior regarding social rules, norms, and values
- Safety
  - Stay within perimeters / safe areas / appropriate distance from adult
  - Be careful around hot or sharp objects
  - Stay safe distance from the ground (refrain from climbing too high or jumping from heights)
  - Cross street / parking lot safely
  - Follow safety instructions
    - Come here
    - Stop
    - Don't touch
    - Move

- Health care
  - Indicate when hurt or sick
  - Take medication when administered by adult

Sexuality

Characteristics of Sexuality:

Sexuality is a natural part of life that each person, including those with disabilities, has the right to express. Understanding sexuality and appropriate expression begins early in development and continues throughout a person's lifetime. The social, communication, and sensory difficulties present can impede sexual development (Stokes & Kaur, 2005). Challenges with sexuality can take many forms. There may be difficulty with expression as the individual may not know what is considered appropriate or inappropriate behavior. Issues related to time and place, unacceptable social contact, or problems with privacy are common.

Instructional Focus Areas:

- Understanding one's own body
  - Identify / appropriately label body parts
  - Identify private sections of the body
  - Understand there are differences in female and male body parts
- Sexual expression
  - Identify rules for self sexual expression
  - Demonstrate appropriate and safe self-expression (refrain from harming self)
- Privacy
  - Identify reasons for privacy for self and others
  - Respect privacy of others
  - Seek privacy appropriately
- Social contact
  - Demonstrate appropriate touch to others
  - Describe good touch versus bad touch
  - Describe circles of comfort (who may touch the person or ask the person to undress)
  - Report inappropriate touch
- Relationships
  - Describe social relationships
  - Describe intimate relations
  - Describe institution of marriage

Motor

Characteristics of Motor:

Gross and fine motor deficits are frequently present. In the area of gross motor, the person may appear to be clumsy or uncoordinated. Participation in physical education or group games may be a challenge. With regard to fine motor, the person may have poor, slow, or labored penmanship. They may have difficulty with activities of daily living such as buttoning, zipping or snapping. Decreased or increased muscle tone may be present making performance of everyday activities difficult. Motor planning may also be impacted resulting in problems executing steps to a motor activity such as kicking a ball or tying a shoe. For students with motor difficulties, it is often necessary to elicit the services of an occupational therapist.

Instructional Focus Areas:

- Gross motor
  - Demonstrate motor control
  - Sit with stability
  - Balance
  - Demonstrate appropriate physical strength
  - Demonstrate locomotion skills
  - Perform motor activities (e.g., jumping, running, kicking, throwing)
  - Demonstrate hand-eye-coordination
  - Demonstrate foot-eye-coordination
  - Perform playground-related skills
- Fine motor
  - Grasp with fist and fingers

- Manipulate objects (e.g., twist, pull, turn pages)
- Transfer objects between hands
- Establish dominant hand for tasks
- Demonstrate bilateral coordination
- Demonstrate hand-eye-coordination
- Demonstrate precise motor movements
  - Trace
  - Handwrite
  - Color
  - Cut
  - Glue
  - Type
- Perform daily living-related skills

Cognitive / Learning

Characteristics of Cognition / Learning:

Unique cognitive profiles include both strengths and deficits. As with all things with ASD, there are a wide range of effects. Not all will experience the problems to the same degree or in the same way; however, cognitive elements pertain to all to some degree, even those with Asperger's Disorder. Common are atypical patterns of attending and failure to receive relevant information. Processing systems may not function instantaneously and automatically resulting in a lack of organization or analysis of this information. This makes retrieval and integration extremely problematic. Students will likely have difficulty with abstract concepts and nuances and have a greater ability to learn material by rote than by symbolism and analogy (Anzalone & Williamson, 2000). Deficits in components related to executive functioning impact ability to organize, problem solve, and plan for future behavior (Lopez, Lincoln, Ozonoff, & Lai, 2005).

Instructional Focus Areas:

- Attending
  - Sustain attention
  - Attend to relevant information or cues
  - Shift attention
- Information Organization
  - Understand cause and effect
  - Understand means to an end
  - Answer why questions
  - Understand inferences
  - Relate information from one experience to another
  - Predict and prepare for upcoming events
  - Organize materials
  - Complete routines and daily activities
  - Sequence tasks and activities
  - Make choices
  - Make decisions
- Abstract Thinking
  - Pretend play
  - Understand others' perspectives
  - Understand abstract (nonvisual) concepts (e.g., ideas, beliefs)
  - Understand cause and effect as it relates to ideas, beliefs, emotions
  - Understand figurative language, jokes, sarcasm
  - Understand difference between real and make-believe
  - Understand difference between fact (or nonfiction) and fiction
  - Tell time
  - Understand concepts related to time
  - Understand past, present, and future
- Information Processing / Comprehension
  - Respond to name and efforts to gain attention
  - Follow simple and multiple step directions
  - Sequence
  - Retell activities / events
  - Retell stories
  - Understand cause and effect
  - Understand emotional relationships
- Concept Formation
  - Sort objects
  - Categorize objects
  - Categorize events

- Categorize relationships
- Categorize social interactions
- Categorize ideas
- Create categories
- Extend concepts to similar items
- Describe similarities and differences
- Understand value, importance, and significance
- Understand nuance and gradation
- Determine the nature of the category (e.g., positive, negative, significant, insignificant)
- Reason to form concepts

✶ Imitation
- Copy motor actions
- Copy verbalizations / words
- Copy actions with objects
- Copy a sequence of actions with objects

✶ Executive functioning
- Set goals
- Plan and execute steps of activity or task
- Complete tasks
- Exhibit appropriate pace to complete task
- Make choices and consider options
- Solve problems
- Inhibit responses
- Monitor and regulate behavior
- Demonstrate reasoning skills

Academic Performance

Characteristics of Academic Performance:

Academic performance, for this discussion, refers to tasks related to the core content areas of English, mathematics, science, and history/social science. The Virginia Standards of Learning (SOL) (VDOE, 2010) outline the curriculum for academic skills as it relates to these areas. This section is not designed to replace the SOL, but to highlight skills in each of the four areas.

The academic abilities of students with ASD vary significantly. Impairment in cognition coupled with deficits in social and communication skills as well as patterns of interfering behavior create tremendous learning challenges (Myles & Simpson, 1998). Compounding the issue is the possibility of uneven skill development. Abilities may be significantly delayed in some areas and advanced in others. Some may even demonstrate advanced development or giftedness (Treffert, 2007).

Curriculum considerations as it relates to the Virginia SOL are discussed further in other sections of this document.

Instructional Focus Areas:

✶ English
- Demonstrate skills related to reading
  - Identify letters and letter sounds
  - Use phonics to read and spell
  - Read with fluency and expression
  - Expand vocabulary comprehension
  - Comprehend fiction and nonfiction reading material
  - Ask and answer who, what, when, where, why, and how questions
  - Identify characters, setting, and important events
  - Retell stories and events using beginning, middle, and end
  - Make predictions
  - Identify topic or main idea
  - Organize information and events logically
  - Make connections between previous experiences and reading selections
  - Draw conclusions
  - Summarize major points
  - Identify cause and effect
  - Compare-and-contrast relationships

- Demonstrate skills related to writing
  - Write letters and numbers
  - Write words
  - Write sentences
  - Develop ideas

- Sequence thoughts and organize writing
- Use appropriate language and descriptive vocabulary
- Apply grade level writing conventions (e.g., punctuation, capitalization, spelling)
- Complete writing process (Prewriting activity, draft, revise, edit)
- Write in different forms and for different audiences
- Write for different purposes
- Collaborate to produce writing

✶ Mathematics

- Demonstrate skills related to numbers and number sense
  - Recognize numbers
  - Count with one to one correspondence
  - Count by ones, twos, fives, and tens
  - Identify ordinal numbers
  - Identify place value
  - Round numbers
  - Compare numbers and identify greater than, less than, equal, some, none, and all
  - Count backwards
  - Identify and represent fractions
  - Identify even and odd numbers
  - Identify and represent decimals

- Demonstrate skills related to computation and estimation
  - Add
  - Subtract
  - Recall addition and subtraction facts
  - Estimate a sum
  - Multiply
  - Divide
  - Recall multiplication and division facts
  - Use descriptive terms to compare quantities (e.g., closer to, between, a little more than)
  - Perform computations with fractions
  - Perform computations with decimals

- Demonstrate skills related to measurement
  - Identify money by name and value
  - Count money
  - Make change
  - Identify measurements used to measure length, weight, and liquid
  - Tell time with digital and analogue clock
  - Use descriptive terms to compare objects by size, weight, volume (e.g., heavier, lighter, longer, shorter)
  - Weigh objects
  - Measure using metric and U.S. customary units and identify equivalent measurements
  - Demonstrate skill related to the calendar
  - Demonstrate understanding of time elapsed
  - Measure perimeter
  - Read temperature

- Demonstrate skills related to geometry
  - Describe size of geometric figures
  - Describe the proximity of objects in space (e.g., near, far, below, above, up, down, beside)
  - Describe and sort geometric figures (triangle, square, rectangle, and circle)
  - Identify and draw points, lines, angles, and intersections
  - Classify angles and triangles
  - Compare properties of two- and three-dimensional figures

- Demonstrate skills related to probability and statistics

- Interpret information displayed in different types of graphs and tables (e.g., picture, bar)
- Display information using different types of graphs and tables
- Describe probability
- Predict an outcome of a simple event
- Find the mean, median, and mode of a set of data

- Demonstrate skills related to patterns, function, and algebra
  - Sort and classify according to attributes (e.g., size, shape, color, thickness)
  - Identify and extend a pattern
  - Demonstrate concepts related to equality
  - Describe concept of a variable

- Science
  - Demonstrate skills related to investigation
  - Record information and observations
  - Describe information and observations
  - Predict
  - Draw conclusions
  - Demonstrate concepts related to force, motion, and energy (e.g., push, pull, speed, direction)
  - Demonstrate concepts related to matter (e.g., color, size, texture, position, solids, liquids)
  - Demonstrate concepts related to life processes and living systems (e.g., plants, animals, habitats, communities)
  - Demonstrate concepts related to interrelationships in earth/space systems (e.g., shadows, temperature, clouds, rainfall)
  - Demonstrate concepts related to earth patterns, cycles, and change (e.g., weather, earth, moon, sun)
  - Demonstrate concepts related to resources (e.g., recycling, conservation, plant products)
- History/Social Science
  - Demonstrate concepts related to history (e.g., past, present, presidents, Rome)
  - Demonstrate concepts related to geography (e.g., city, state, country, map skills)
  - Demonstrate concepts related to economics (e.g., needs, wants, employment, goods, services, money)
  - Demonstrate concepts related to civics (e.g., citizenship, government, freedom, ethnicity)

Sensory Processing

Characteristics of Sensory Processing:

There are seven senses we use to perceive our environment: visual, auditory, olfactory, oral, tactile, proprioceptive (registration of where your body is in space and in relation to objects), and vestibular (balance and movement). Differences in sensory processing can be confusing and have a pervasive effect (Whitman, 2004). Oversensitivity and/or undersensitivity to sensory input results in patterns of behavior which detract from learning experiences. Difficulties with regulation create heightened arousal and inattention. When the sensory processing systems are working correctly, the person is able to take in information from the environment, organize it, make sense of it and execute a response automatically. When they are not functioning appropriately, there may be interference, distractions, and difficulty with behavior.

Instructional Focus Areas:

- Adaptive skills
  - Demonstrate coping skills
  - Demonstrate tolerance skills
  - Demonstrate positive replacement skills

- Interests/activities expansion

- Emotional understanding
  - Recognize emotional state in self

- Recognize conditions which elicit emotional states

✶ Self-management

✶ Self-awareness
- Identify sensory needs
- Identify positive and replacement strategies
- Identify problematic environmental stimuli

✶ Self-advocacy
- Communicate sensory needs
- Communicate positive sensory strategies
- Advocate for accommodations

Restricted and Repetitive Patterns of Behavior

Characteristics of Restrictive and Repetitive Behaviors:

Unusual and distinctive patterns of behaviors may be demonstrated, including preoccupation with objects or parts of objects, intense interest in specific topics, or an intense need for sameness. Students may engage in stereotyped, or repetitive motor movements, which commonly manifest as finger flicking, hand flapping, unusual eye gazing, or spinning. Often, behaviors impact the student's education. Stereotypies can interfere with learning new behaviors and perseverations may limit motivation.

Many of the restricted and repetitive behaviors may be caused by a number of different factors, such as sensory processing, difficulties in understanding social situations, limited play skills, and anxiety (Lopez, Lincoln, Ozonoff, & Lai, 2005). When planning instruction, educators need to consider the behavior and its function for that individual student and develop a plan accordingly. Successful teaching strategies should focus on making environmental adaptations to decrease interfering behavior and help the student learn other more appropriate behaviors that will serve the same function.

Instructional Focus Areas:

✶ Communication
✶ Social
✶ Play and leisure
✶ Sensory processing
✶ Cognitive / learning
✶ Adaptive
✶ Self-management
✶ Self-awareness
✶ Safety

The Educational Environment

The diagnosis of ASD does not dictate a specific placement. ASD may occur by itself or in association with other disabilities. Educational placement decisions must be based on the assessed strengths, challenges, and educational needs of the student rather than on the label of autism.

School divisions must provide a full continuum of placement options. This requires a flexible model that is able to address the individual needs of these students. Placement options range from total inclusive settings where students receive their education alongside nondisabled peers to private placement in residential programs for individuals with disabilities. Within that range, a wide variety of plans can be created to meet the distinct needs of each student. Using the continuum concept makes it more likely that each student will be placed appropriately in an environment that is specifically suited for him or her.

Due to the learning characteristics of students with ASD, school divisions must provide a full continuum of placement options. This requires a flexible model that is able to address the individual needs of these students.

Least Restrictive Environment (LRE)

The IDEA (2004) requires that students with disabilities be educated in the "least restrictive environment" (LRE) appropriate to meet their needs. This requires those with disabilities to be educated in the general education environment with children who are nondisabled "to the maximum extent appropriate." When faced with the challenge of selecting an appropriate placement for a student, parents and professionals need to understand the intent of this law. The IDEA (2004) recommends that consideration of the LRE will begin with placement in the regular education classroom. However, IDEA recognizes that it is not appropriate to place all students in this setting. What is required is individualized consideration of all settings in terms of what will best meet the learning needs and develop the strengths of the student. Placement should never be based on the diagnosis or disability category. The following should be considered when determining placement:

- ✶ Goals and objectives of the student
- ✶ Nature of skills targeted
- ✶ Socialization opportunities
- ✶ Student's ability to attend and focus
- ✶ Teaching methods needed
- ✶ Amount of direct instruction required

Table 1 provides an LRE continuum, outlining placement from what is considered to be the least restrictive to the most restrictive environment. The continuum is fluid allowing students to move between placements based on needs. Regardless of the placement, individualized supports are required. This is true even for students accessing the general education setting, whether it is for part of or all of the school day. At a minimum, supports in the form of accommodations and modifications must be identified and implemented. More information on accommodations and modifications is provided in a subsequent section of this document.

Inclusion Opportunities

Teaching students how to form relationships, understand the feelings of others, and develop appropriate social skills is just as important as academic learning when considering the future potential of the individual. Because social development is one of the greatest areas of need for a student with ASD, schools carry an important responsibility to work this into the curriculum whether the student is in the regular educational setting or the special education classroom (Church, Alinsanski, & Amanullah, 2000). Failing to provide students with ASD with social and learning opportunities is likely to substantially impede development.

Table 1. Least Restrictive Environment Continuum

Least Restrictive	General Education with Special Education Support Services
	Pull-Out Resource Room Support
	Partial-Day Self-Contained Special Education Class with Mainstreaming Opportunities in General Education
	Full-Day Self-Contained Special Education
	Home Instruction
Most Restrictive	Out of Division Placement - Day Schools
	Out of Division Placement - Residential Programs or Hospital Schools

Teaching students how to form relationships, understand the feelings of others, and develop appropriate social skills is just as important as academic learning when considering the future potential of the individual. Because social development is the greatest area of need, schools carry an important responsibility to work this into the curriculum whether the student with ASD is in the regular educational setting or the special education classroom.

Inclusion is the practice of placing individuals with disabilities into settings and situations with their peers without disabilities. Inclusive opportunities are not about a location but about how a child is educated and the attitudes, understanding, and experiences involved. Providing meaningful inclusion opportunities is crucial to learning socially appropriate behaviors from those with whom they will interact throughout their lives. Supporting opportunities for inclusion with peers fosters the development of relationships and increases communication, self-determination skills, and independence. The individual with ASD participates in the expression and reciprocation of social interactions, the use of communication, and the following of social rules and norms. Varying levels of support may be required to understand and learn from these actions but it is vital to consider that naturally occurring interactions and social events are more meaningful and beneficial in the long term than artificially constructed events.

The extent of inclusion should be driven by the student's needs as determined by the educational team, not by the district's convenience (Batten, 2005). Teams must assure a balance between inclusion and direct, specialized instruction. For many students with Asperger's Disorder, for example, their educational program can be unbalanced with too much time in inclusion and not enough direct instruction in social communication and interaction. Likewise, students with ASD who also have a significant intellectual disability could frequently experience the opposite: too much direct instruction time in self-contained special education environments and not enough inclusive opportunities.

Table 2. Components of Successful Inclusion

Component for Successful Inclusion	Strategies and Skills
Teachers are trained in a wide variety of teaching methods to address diverse student need	Priming, prompt delivery, daily schedules, mini-schedules, systematic instruction, peer mediated interventions, Augmentative and Alternative Communication (AAC)
Adequate supports are provided so skill development is integrated into the general education classroom activities	Environmental modifications, visual supports, schedules, structured activities, small group instruction, self-management strategies
Adequate supports are provided to the student with ASD to foster peer interaction	Peer mediated interventions, peer buddies, Lunch Bunch, visual supports, integrated related services personnel, adult support
Team members collaborate and support the inclusion opportunity	Parent involvement, parent-teacher conferences, home-school communication book, team meetings, parent training, paraprofessional training

Inclusion must be implemented with care and requires intensive planning. It is not sufficient to place an individual in an inclusive environment without preparing them with the skills necessary to actively and fully participate (Harrower & Dunlap, 2001). This is especially critical given the intense challenge students with ASD face in social functioning. Table 2 outlines the components required for successful inclusion and examples of specific strategies.

Classroom Management

Classroom management, whether it is general or special education, requires special considerations for this group of students. Classroom management is going to be a mix of traditional and nontraditional classroom management techniques. Examples of these strategies include:

Traditional Strategies

- ✶ Creating rules
- ✶ Preparing lesson plans
- ✶ Establishing routines
- ✶ Establishing classroom procedures

Nontraditional Strategies

- ✶ Using visual supports
- ✶ Providing schedules
- ✶ Collaborating with many adults in a single day
- ✶ Implementing Behavior Support Plans

An important part of managing a classroom is teaming. In many cases, the classroom teacher is a member of a team that includes other adults. The classroom teacher is often expected to be the case manager or instructional leader. With so many people working with one student, each party involved will need to build their collaboration and communication skills efficiently. Collaboration helps students with ASD function better in the home, community, and throughout the school building.

For those receiving services in a special education classroom for students with disabilities (resource or self-contained) classroom management becomes especially critical. Typically, there are multiple adults, often consisting of one classroom teacher and one or more paraprofessionals, working in a small space. There are frequent transitions between activities and room locations. Teachers are charged with ensuring each student receives an appropriate education by individualizing content, strategies, and format. The need for direct adult attention in one-to-one and small group instruction further complicates the matter.

Teachers need to spend time to create a classroom management system that will optimize direct instruction of students, engagement, and result in learning, while minimizing chaos or confusion for staff and students. There are a number of strategies to assist with this endeavor:

- ✶ Providing a written plan for classroom roles and responsibilities will be helpful in creating an organized and effective classroom staff team.

- ✶ Establishing a job chart that is visually displayed will help all teaching staff understand their individual responsibilities and shared tasks.

- ✶ Assigning staff to an activity, a location of the room, or specific students will ensure all students receive adult attention as needed and will reduce confusion regarding roles and responsibilities.

- ✶ Providing written instructions for implementing programming, whether it is for skill acquisition or behavior support, and verbally discussing them prior to

Teachers need to spend time to create a classroom management system that will optimize direct instruction of students, engagement, and result in learning, while minimizing chaos or confusion for staff and students.

instruction, will ensure everyone is knowledgeable of the program.

- ✶ Matching class activities with staff strengths and interests will create motivation and enhance learning.

- ✶ Working together to have each person establish their morning break (if applicable) and lunch time during activities which can be handled by a smaller amount of staff members will help ensure staff are available during key periods and instructional sessions.

Personnel

As noted above, in many cases there is a team of parents and professionals who support a student with ASD. Professionals typically include a general education teacher, special education teacher, speech/language pathologist, and occupational therapist. Others, such as a guidance counselor or physical therapist, may also be part of the team. Another potential service provider is the paraprofessional. Paraprofessionals are essential to the learning process for these students. Paraprofessionals can play an essential role in supporting students academically, socially and behaviorally.

Schools are faced with critical and impactful decisions regarding staffing of personnel. According to the *Regulations Governing Special Education Programs for Children with Disabilities in Virginia* (2010), when providing services to a student with ASD, there should be one teacher for every six students or one teacher and one paraprofessional for every eight children. Careful consideration must be given to the pervasive and tremendous needs of this group of students. The challenge is how to provide differentiated curricula that are adapted to the social, cognitive, and communication needs of students. Low student-teacher ratios are frequently needed to provide an appropriate education. It is strongly recommended that each student's needs are evaluated on an individual basis to make staffing determinations (Simpson, 2004).

Professionals must be familiar with theory and research concerning best practices for students with ASD.

For professionals and paraprofessionals to effectively support this group, there is a strong consensus in the research literature that all working with a student with ASD must be qualified to do so (Garet, Porter, Desimone, Birman, & Yoon, 2001; Leko & Brownell, 2009; Lynch & Adams, 2008; Scheuermann, Webber, Boutot, & Goodwin, 2003). Professionals must be familiar with theory and research concerning best practices for students with ASD including instructional methodologies, Assistive Technology (AT), Augmentative and Alternative Communication (AAC), inclusion, adaptation of the environment, language interventions, social supports, behavior supports, assessment, and the effective use of data collection systems (NRC, 2001). Proper education and training can help shape the specific skills needed to work in a class with these students and is essential for professionals to provide effective and accessible instruction that optimizes learning outcomes.

Organization and Structure

Students with ASD will benefit from an environment that is structured and provides predictability and organization. Consistency is a key consideration for all educational settings regardless of whether it is a general education or special education classroom or another setting in the school such as the cafeteria, art room, or playground (Panerai, Zingale, Trubia, Finocchiaro, Zuccarello, Ferri, & Elia, 2009).

Individuals with ASD benefit from an environment that is structured and that provides predictability and organization.

Physical Environment

A well organized physical environment is critically important as it provides the structure and predictability that many students with ASD need to understand expectations and participate (Blakeley-Smith & Carr, Cale, Owen-DeSchryver, 2009). The physical environment must be simplistic and organized with a strong visual component. The room should be free of clutter. Auditory and visual distractions are to be limited as much as possible. For example, wall hangings that are solely decorative are kept to a minimum.

The environment is designed to support student independence. Intended paths of travel and material locations are obvious and accessible. The physical structure of the environment indicates and supports expected behaviors. Different tasks occur in specific, obvious locations and are visually labeled to convey the purpose of the area. For example, the reading corner may be physically defined by a reading couch and bookshelves with a rug while also visually marked with a picture of a person reading a book.

Organization of materials is required to help the student prepare for activities, work on assignments, and complete daily routines. Each student must have a designated location for belongings. Arrangement of materials is carefully planned to orchestrate accessibility and easy management. Organization measures such as labeling or color coding may be helpful.

Educators must design learning locations in the classroom. Specific configurations may be needed for individual instruction, small group instruction, or workstations designed for independent work. Students with ASD often require areas designated for taking a break, engaging in sensory related activities, or calming. The physical environment must account for all of these needs and must be strategically designed to increase on-task behavior and reduce distractions. For example, it may be problematic to put the individual instruction area next to the computer. Below is a list of other considerations for the physical environment:

- ✶ Create clear physical boundaries for each area
- ✶ Visually define areas for each activity
- ✶ Provide learning locations
- ✶ Provide designated area for breaks and sensory activities
- ✶ Provide visual reminders of classroom expectations
- ✶ Provide adequate spacing to allow for personal space preferences
- ✶ Provide location for student belongings
- ✶ Organize materials
- ✶ Place materials in an accessible location
- ✶ Use strategies to foster independence with materials (e.g., color coding, labeling)

Students will drastically range in the amount of support they require to be successful in various environments, therefore it is best to structure and organize to the maximum extent in order to accommodate the range of skills.

Schedules

Schedules assist the student in being informed about their routine and increasing independence (Sterling-Turner & Jordan, 2007). Schedules take an abstract concept, such as time, and present it in a concrete and manageable form. Visual schedules allow students to anticipate upcoming events, predict change, develop an understanding of time, and reduce fear of the unknown. Ultimately, a schedule can make the day more predictable and less anxiety provoking. This in turn can not only reduce interfering behavior but can lead to increased independence.

Schedules may be presented in a notebook, poster, or even on a computer, handheld device (iTouch, iPad) or smart phone. They can be stationary and in a centralized location that is easily accessible at all times during the day or may be portable, remaining with the student at all times. The schedule can be presented using a variety of formats. Table 3 presents the schedule hierarchy moving from concrete to abstract representation. The complexity of a schedule depends on the needs of the individual and what strategies may best foster success and independence.

Table 3. Schedule Hierarchy

	Item Used	Description	Example
Concrete	Object Schedule	Real or miniature objects	A plastic cup indicates snack time. A red ball indicates recess.
	Picture/ Photograph	True to life images (photograph)	A picture of student's bus represents time for home.
	Icon/ Color	Color drawings or symbols	A color drawing of a book represents reading center.
	Icon/ Black and White	Black and white drawings or symbols	A black and white drawing of a computer indicates computer time.
	Icon with word	Drawings or symbols paired with the written word	A picture of a desk paired with the written word "desk" represents work.
Abstract	Written word	Written or typed words without picture symbols	Written word "lunch" indicates time for lunch and to line up.

Table 4. Types of Visual Schedules

Length	Description	Example
Week or Month	Calendar is provided that outlines outings and events for the week or month	Weekly schedule contains the following: Mon: School, gymnastics Tues: School, home Wed: School, speech Thurs: School, home Fri: School, home Sat: Soccer, McDonalds Sun: Grandma's house
Full day	Schedule is available from school arrival to departure in its entirety.	Schedule begins at 8:30 and ends at 3:30 and contains icons representing all major activities.
Half Day	Schedule is available for only half the day then rebuilt for the remainder of the day.	Morning schedule is from 8:30- 11:30. Afternoon Schedule is from 11:30-3:30.
Partial Day	Schedule outlines upcoming 3-5 events to assist with shorter intervals of the day. Schedule is rebuilt as time elapses.	First: Mathematics Next: Bathroom Then: Recess
Mini-Schedule	A schedule is provided for a task or activity that provides the sequence of steps.	The activity to be completed is mathematics. The schedule contains the following: · Turn in homework · Do page # 5 in workbook · Sort coins · Put away materials · Take a 5 minute break

Schedules can vary in length and can be formatted to present any time frame. Common schedules represent the entire day, partial day, or a specific activity or task. For students who require more information, a weekly or monthly schedule depicting important events can be used. Table 4 outlines different types of schedules. Please note, a schedule should reveal whether it is a typical day or a day with unusual events. In the case of unusual events, preparation should take place well before its actual occurrence.

The ultimate goal is for students to manipulate and use schedules independently. It is unreasonable to expect a student to automatically know how to use it. The concept and its implementation must therefore be taught. Explicit instruction and modeling of how and when to use the schedule must be provided until data supports student independence.

Transitions

Transitioning is a significant issue for this population (Banda & Kubina, 2006). This may include transitioning from one activity to another or from one setting to another. There may not be awareness of naturally occurring environmental cues signaling a change, whether routine or unusual. Further, students may not be aware of what is happening next. Advanced preparation for a transition and the pending activity can prevent students from feeling anxious, frustrated, and overwhelmed. Clearly defined expectations can increase knowledge of the rules, while reinforcement for appropriate behavior may provide the necessary motivation.

Difficulty with understanding temporal relations or the passage of time is one reason why transitions may be a challenge. Providing an appropriate timekeeping device or strategy to indicate the length of an activity can reduce anxiety and support independence. A clock, stopwatch, alarm, and hour/minute glass are examples of timekeeping pieces that can be provided to an individual student or class.

Advanced preparation for a transition and the pending activity can prevent students from feeling anxious, frustrated, and overwhelmed.

When choosing how to prepare for a transition, consideration should be given to how the student best receives information and reasons for the transition difficulties. Strategies to assist with transitions include:

- ✶ Provide a consistent and clear timekeeping method.
- ✶ Provide multiple warnings of pending transition.
- ✶ Provide predictable visual and environmental supports to facilitate transitions (e.g., timer, schedule, wait station, transition object).
- ✶ Establish routines to support transitions between activities, people, and environments.
- ✶ Provide clear beginning and ending to tasks or activities.

Rules

Class rules are an important component of an orderly educational environment. Rules express and objectify underlying social and behavioral expectations which can be difficult for a student with ASD to ascertain. Rules should be posted throughout the room in multiple locations at the student's eye level for easy reference. Different rules may be necessary for specific tasks and should be posted in the related area (e.g., computer rules posted at the computer area).

Rules should be minimal (no more than five) and easy to comprehend and apply. They are to be represented in a format that is readily understood which may include pictures, icons, and/or words. It also may be helpful to have pictures of the behavior you desire posted with the rule. For example, a picture of a person sitting quietly at their seat with their hand raised may add clarification. In the case that written words are used, the rule should

be written as simply as possible using clear and concrete language.

Steps should be taken to ensure the student knows, understands, and can apply the rules in a variety of situations. Proactive and frequent review will provide a reminder of the expectations. Practice will strengthen their use and application. Verbal praise or other reinforcement based on appropriately following the rules will help students to recognize the behaviors they are to be demonstrating. Providing a review before transitioning to another activity will assist the student in knowing what the expectations are between activities and settings.

It is recommended to overlap rules in different settings to the maximum extent possible. For example, if a student must raise his hand to use the restroom, this same rule should be applied in the cafeteria and music room. When rules change based on setting and context the student should be instructed of the change to avoid confusion. All staff must be knowledgeable of rules and ensure consistent enforcement.

Curriculum Framework

In Virginia, the curricular expectations for academic achievement are found in the Virginia Standards of Learning (SOL) Curriculum Framework or the Aligned Standards of Learning (ASOL) Curriculum Framework (VDOE, 2010). It is important for the team to consider the type of curriculum through which a student will acquire academic skills. The team must determine the skills and curricula necessary to maximize future levels of independence. Snell and Brown identified four potential ways to address the curricular needs of students with disabilities (2006). They are presented in Table 5 with a description of the relevant Virginia curriculum that might be delivered through the classroom.

General Curriculum

The Virginia SOL are considered to be the "general curriculum" which guides the educational content of all students unless otherwise specified. Students with ASD must have access to this curriculum to

Table 5. Four Curriculum Approaches to Teaching Functional Academics *(Snell & Brown, 2006)*

Curriculum	Learning Outcome	Related Virginia Standards
General education curriculum with or without adaptations	Student will master grade level material with outcomes similar to classmates.	Virginia Standards of Learning
Functional, generalized skills usable across life routines	Student will master critical skills for use in home, community, school, and work settings.	Virginia Standards of Learning or Virginia Aligned Standards of Learning depending on age of student and current level of performance.
Embedded academic skills usable in specific life routines	Student will acquire academic skills in the context of their daily routine, e.g.,: reading the menu choices at lunch, counting the coins to make a vending machine purchase.	Virginia Aligned Standards of Learning
Adaptations to bypass academic skills	Students will use community-based functional adaptations to academic skills such as matching coins and bills to a money placket, using picture menus to order food at restaurants, following picture schedules to read.	Virginia Aligned Standards of Learning

the greatest extent possible. While adhering to this requirement, the team will determine what is appropriate for the specific student and determine instructional methodologies, modifications, and accommodations required for student success

A functional curriculum is one focused on practical life skills and usually taught in community-based settings or natural environments with concrete materials that are a regular part of everyday life.

Functional Curriculum

Students who have intellectual disabilities in addition to ASD or students with ASD whose learning abilities are impacted by some of the secondary characteristics mentioned previously (such as attention or processing) may receive their education using a functional curriculum. In this case, the Virginia ASOL will be the dominant curricular focus. A functional curriculum is one focused on practical life skills and usually taught in natural environments with concrete materials that are a regular part of everyday life. Teams embed academic content into functional activities to assure students have their immediate and long-term needs met. The purpose of this type of instruction is to maximize the student's generalization of his/her skills to real life. Learning with a functional curriculum is critical to helping some students reach their potential as active participants in home, school, and community environments.

Mixtures of Curriculum

Often there is a balance that needs to be met when addressing the educational needs of students with ASD. There is not one curriculum mode that suits each person. It is possible for any given student to receive instruction in different curriculum for different subjects. It may be necessary to use a mixed-method curriculum to recognize a student's individual knowledge, readiness, language, learning style, and interests. For example, a student who has strength in mathematics might receive instruction from the general curriculum with adaptations, while that same student might receive instruction from a functional curriculum in reading. A mixed curriculum is most likely to be built around the existing general curriculum and involve teachers' alterations, modifications and enhancements. The intent of a mixed curriculum is to maximize each student's growth and individual success by meeting each student where he or she is and assisting in the learning process.

Assessment Frameworks and Procedures

The purpose of an educational assessment is to identify each student's strengths and needs to assist in determining individualized goals and outcomes for developing an appropriate IEP. An educational assessment is typically conducted by a multidisciplinary team with representation from a variety of professionals (e.g., educators, speech-language pathologists, occupational therapists, behavior specialists, family members, and other professionals as appropriate).

Due to the idiosyncratic communicative and social characteristics of individuals with ASD, accurate assessment can be a challenge.

Due to the idiosyncratic communicative and social characteristics of individuals with ASD, accurate assessment can be a challenge (Prelock, 2006). Students may not always be able to understand instructions associated with standardized assessments and may also have difficulty responding to test items. They may exhibit off-task behaviors, distractibility and variable motivation to complete tasks. Therefore, the use of a variety of assessment strategies that can most accurately (and authentically) identify an individual student's skills across a variety of instructional settings is recommended. This section is designed to provide educational teams with strategies for conducting assessments that serve as the foundation for designing effective instructional programs for these students.

Getting Started

Students with ASD generally demonstrate deficits or challenges across a variety of skill areas. When conducting assessments to assist in the educational planning process, the team must select tools based on several factors:

- ✶ What developmental and skill areas need to be assessed?
- ✶ Do skills related to the core and secondary characteristics of ASD need to be assessed (e.g., social, pragmatic communication, sensory, cognition)?
- ✶ What tools or methods are best suited for assessing those skills?
- ✶ What methods provide an authentic evaluation of the student's ability to apply skills in real life situations?
- ✶ Are these assessment tools or strategies appropriate for use based on the student's individual characteristics and learning style?
- ✶ How can the assessment be conducted or modified in order to obtain the most authentic, reliable, and valid information?

Assessment Tools and Strategies

Depending on the individual, a variety of assessment tools and strategies are typically used to obtain an accurate and authentic assessment. These tools include (1) standardized assessment tools, (2) informal and curriculum-based assessments, and (3) data driven assessments. Across these tools are also different formats, which include: direct assessment of skills, rating scales, interviews, and direct observation.

Standardized Assessment Tools

Although standardized assessment tools can be useful in helping with the educational planning process, this type of assessment tool is most appropriately used when assessing a student's skills in a variety of core areas: cognition, preacademics, academics, speech, language and communication, and adaptive behavior. Only a few standardized assessment tools have been developed specifically for use with students with ASD. They include:

- ✶ Psychoeducational Profile - Third Edition (PEP-3; Schopler, Lansing, Reichler, & Marcus, 2005)
- ✶ Adolescent and Adult Psychoeducational Profile (AAPEP; Mesibov, Schopler, Schaffer, & Landrus, 1988)

Because of this, the educational team may choose a standardized assessment tool designed to assess a particular skill area, but one that has not necessarily been normed on students with ASD. In this case, adjustments may need to be made on the administration and interpretation of the information obtained. Educators may select evaluations based on a number of factors including:

- ✶ Purpose of the assessment
- ✶ Population on which it was normed (disability, age, race, ethnicity, gender)
- ✶ Testing format (Is it appropriate for the student?)
- ✶ Appropriateness for both the chronological and mental age of the student

Although standardized assessments can be useful for determining skill levels, it is also important that school personnel are cognizant that standardized tests (particularly IQ or other assessments of intellectual functioning) often provide inaccurate results for these students. As a result, IQ and other standardized intellectual measures often underrepresent an individual's skills, including intelligence (NRC, 2001). It is important to consider such variables when interpreting scores. Furthermore, to gain an accurate profile of a student, teams will find it useful to administer

the standardized assessment for the purpose of obtaining norm-referenced scores, then supplement the information using modifications to the standardized tests or other types of nonstandardized assessment listed below.

Curriculum-Based Assessment

Informal assessments, including curriculum-based assessments (CBA), can often provide a more authentic and accurate assessment of a student's ability across a variety of environments and settings. CBAs provide an assessment of an individual's abilities, preferences, strengths, and needs. In particular, CBAs provide an assessment of an individual's progress and needs in relation to a particular curriculum and can be used to document progress toward mastery of learning objectives. The following are examples of several informal and CBAs educators may find beneficial:

- The Assessment of Basic Language and Learning Skills - Revised (ABLLS-R; Partington, J., 2006)
- The Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP) (Sundberg, M.L., 2008).
- Assessment of Social and Communication Skills for Children with Autism (Quill et al., 2000)
- Brigance Diagnostic Inventory of Basic Skills (Brigance, 1983).

Data-driven Assessment

Standardized and CBAs provide valuable information; however, the use of assessments that include ongoing data collection is one of the most useful approaches toward obtaining a valid and authentic assessment (Heflin & Alaimo, 2007). This type of assessment is instrumental in assessing true ability and performance in the educational arena. In other words, a data-driven assessment answers the question "How does this individual function in his/her natural environment?" The most common method for data-driven assessments is the use of direct observational procedures; however, interviews or ratings scales completed by individuals who observe students across settings can also be useful in gathering pertinent information. Data-driven assessments are typically conducted to examine the use of functional skills, such as functional communication, social competence, self-help, and activities of daily living. Additionally, a data-driven assessment is often used to examine the functions of challenging behaviors that may interfere with an individual's learning (commonly referred to as a Functional Behavioral Assessment [FBA]). Through the use of direct observational procedures (and interviews or rating scales) of an individual's strengths and needs across various settings and the demands of these settings, the educational team is able to gather information for designing an individualized curriculum to help facilitate functional use of skills across natural contexts. For examples of data-driven assessments, see Appendix A.

Developmental and Skill Areas

Determining the most relevant areas to assess is based on the student's individual developmental strengths, learning characteristics, and deficits. Many students with ASD may have strengths in one skill area (e.g., memory); yet, have difficulties in another area (e.g., pragmatic language skills). Therefore, a variety of assessment strategies may be appropriate across different areas of development (Gabriels & Hill, 2002). Prior to starting the assessment, it is critical for the educational team to decide: (1) what developmental skill areas need to be assessed; and (2) who should be part of the assessment and intervention team. For example, if a student demonstrates sensory deficits, it would be important to conduct an occupational therapy evaluation and include an occupational therapist on the team. Likewise, if the student demonstrates gross motor deficits, a physical therapist would be an important part of the team as well. A comprehensive assessment of all skill areas should be conducted to gain an overall "picture" of the student's individual strengths, characteristics, and needs.

Cognition, Preacademic and Academic Skills

Typically, standardized, norm-referenced assessment tools are used to assess a student's cognition; however, informal assessments can also be used to examine how students use their cognitive abilities. Gaining an accurate understanding of a student's cognitive processes is essential in helping to design instructional programming and is linked to other development areas as well (e.g., social competence, language, and communication skills).

Given the unique learning styles of students with ASD, both standardized and informal tools are often used to assess pre-academic and academic areas (i.e., mathematics, early literacy). Standardized tools can help assess the student's knowledge base and potential; whereas informal assessments, such as CBAs, can provide useful information on a student's learning style (or how best a student learns) and measure a student's skills based on the classroom curriculum.

Social and Behavioral Competence

Social and behavioral skills are context specific and often vary depending on situations, settings, and people. Although standardized assessments can be useful, the use of direct observations and data-driven strategies that assess a student's demonstration of these skills can be most helpful in identifying skills in a variety of environments. Additionally, a thorough assessment of the environments that encourage (or inhibit) and reinforce these behaviors can assist the team in structuring a learning environment that promotes adaptive behaviors while decreasing the occurrence of behaviors that interfere with learning.

Speech, Language, and Communication Skills

Similar to social and behavioral competence, speech, language, and communication skills occur throughout the day and across a variety of contexts. Thus, assessing a student's speech, language, and communication abilities within context is essential for creating an effective instructional program. Standardized, informal, CBA, and data-driven assessment tools and procedures can all provide information on an individual's speech, language, and communication abilities as well as how they use these skills across a variety of situations and people.

Sensory Processing

When differences in sensory processing are present, students often engage in repetitive behaviors and/or even challenging behaviors that interfere with

Table 6. Assessment Tools Based on Skill Area

Skill Area	Standardized Tools	CBA	Data-driven Assessments		
			Interviews	Rating Scale	Direct Observation
Cognition	✓	✓	✓		✓
Pre-academics and Academics	✓	✓			✓
Social and Behavioral Competence	✓		✓	✓	✓
Language/ Communication Skills	✓		✓		✓
Sensory Deficits	✓		✓	✓	✓

their learning. Sensory processing differences may also interfere with a student's ability to learn within a certain environment (such as humming lights) or under certain conditions (such as having a movement-seeker seated at a desk for extended periods of time). A comprehensive assessment of a student's sensory processing abilities by an occupational therapist is an important tool for designing an effective instructional program, schedule, and environment. This may also include an assessment of the function of these behaviors to assure that they are sensory-based.

Other Developmental Areas

Similar to all students receiving special education services, a comprehensive educational assessment should include any areas of development that may interfere with their learning. Therefore, an assessment of an individual's vision, hearing, and motor abilities should be evaluated by team members with expertise in these areas. Table 6 outlines the types of tools and strategies that may be most appropriate to use to obtain an accurate and authentic assessment across skill areas.

Matching Assessment Tools to Student Characteristics and Learning Styles

Prior to beginning the assessment, the educational team will want to identify the individual student's characteristics and learning styles. This information will help the team plan the assessment and increase its authenticity. The following are several factors the team will want to consider and adapt the format of the assessment as needed:

- Does the student have any visual, auditory, or medical concerns that may interfere with the assessment? If so, how can the assessment be adapted to accommodate these areas of concern?
- What is the best means of communicating with the student (e.g., pictures, spoken words, gestures)?
- What communication forms does the student use to communicate with others (e.g., spoken words, gestures)?
- Is the student motivated to engage in the assessment? If not, what would help motivate the student to participate in the assessment?
- Is the assessment environment conducive for conducting the assessment? Are there distractions in the environment that may interfere with the assessment?
- Is the assessment an appropriate match for the student's attention span? Are there modifications or accommodations to the assessment process or materials that should be made to help increase the authenticity of the assessment?
- Does the student demonstrate challenging behaviors that are interfering with the assessment? Can these behaviors be prevented or minimized during the assessment?

Increasing the Authenticity, Validity, and Reliability of Assessment

To increase the authenticity, validity, and reliability of the information obtained from the educational assessment consider the following suggestions:

- Assure that all persons who administer assessments are professionally trained in the assessment tool and have training and expertise in using assessment tools with individuals with ASD.
- Conduct assessments across several different sessions in order to obtain a representative sample of the student's behavior and skills. Remember that you want to obtain accurate information about the student's strengths and needs. Based on

the student's level of engagement, attention level, and cooperation, this may take repeated assessments across several times or days.

- ✶ Conduct the assessment in a familiar setting with familiar people. Students with ASD often have difficulty with change and generalizing skills across settings. Therefore, it is important for the assessment to be conducted in familiar settings with familiar people and materials.

- ✶ Increase engagement and decrease challenging behaviors. Students may need to be motivated to engage in the assessment. Using rewards and reinforcement for engagement in assessments may increase the student's level of cooperation and engagement and decrease challenging behaviors.

Goal Development

The role of assessment is to improve student learning by highlighting areas of strengths, needs, as well as emerging skills. Once the educational team has conducted a thorough assessment, the next task is to convert results into goals. The ability to determine appropriate goals is one of the most important roles of the educational team. After all, a student's goals comprise the skills a student will master in the school year and defines the specialized instruction that he or she will receive. Goals should address all areas of student need, regardless of whether or not they are commonly associated with the identified disability.

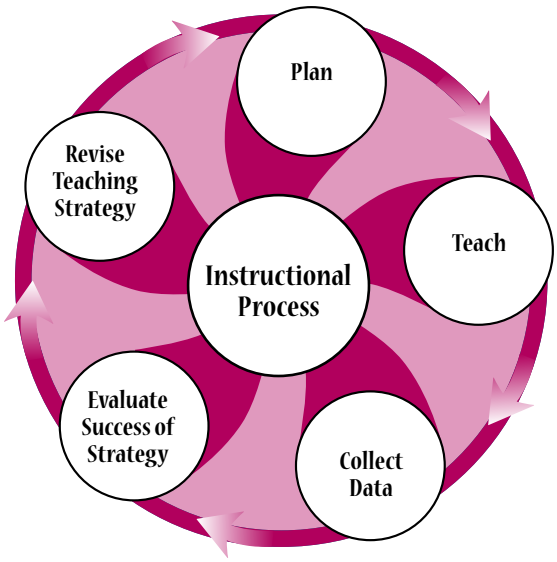
The ability to determine appropriate goals is one of the most important roles of the educational team. After all, a student's goals comprise the skills a student will master in the school year and defines the specialized instruction that he or she will receive.

Team members should consider and prioritize the following when developing goals:

- ✶ skills needed to be involved and make progress in the general education curriculum;
- ✶ functional independence;
- ✶ communication;
- ✶ access to the community;
- ✶ type, frequency, nature, and reciprocity of interactions;
- ✶ work habits and learning skills;
- ✶ interfering behaviors; and
- ✶ safety concerns.

School teams must collect data and provide ongoing assessment to verify acquisition of skills and the appropriateness of goals. It is possible for goals to require revision throughout the school year. Figure 1 shows how data and assessment informs educational practice through the instructional process.

Figure 1. The Instructional Process



The design of the goal is very important. Goals must be written in measurable terms to ensure the team can assess progress. A measurable goal has five components. They are:

1. The condition under which the student will perform the skill;

2. The student's name and future tense modifying verb;

3. The skill written in observable terms;

4. The criterion that the student must demonstrate to master the goal; and

5. The amount of times the student must maintain the mastery criterion to confirm mastery.

Below is an example of a measurable goal that meets all of these requirements for Megan who is in a functional skills curriculum:

- When purchasing juice in the cafeteria, Megan will independently count and provide the coins needed to make the purchase with 100 percent accuracy on four out of five measured opportunities.

Next is an example of a measurable goal for Ishaan who is in a general education with modifications curriculum:

- When asked to identify how he feels, Ishaan will state how he feels and will describe why with 80 percent accuracy on four out of five measured opportunities.

Instructional Strategies

There are a number of instructional strategies identified as evidence-based for this population. Prior to implementing instructional strategies, there are several important considerations that must be taken into account by the team. First, teachers can feel confident implementing any evidence-based strategy provided they are able to implement the strategy with fidelity. In other words, instructional strategies chosen for students with ASD should be implemented by knowledgeable and skilled individuals. Second, teachers must ensure they are using the strategy to teach an appropriate skill or skill set. Individual strategies may be effective only when used to teach identified skills and not when universally applied to any skill. Finally, it is important to verify the success of the strategy through data collection. Not all strategies will be effective with all students. Progress must be evaluated on an individual basis and changes made accordingly.

The table on the next page outlines the 24 evidence-based strategies for students with ASD according to the National Professional Development Center on Autism Spectrum Disorders. The table depicts the type of skills best matched to the methodology. Additionally, Appendix B provides a detailed description of the steps for implementation of each. More information on how to implement a specific strategy can be found at *http://autismpdc.fpg.unc.edu/content/briefs*.

The evidence-based strategies outlined are the ones available at the time of publication of this document. The reader, once again, is encouraged to seek information regarding other evidence-based strategies that may now be available.

Instructional Considerations

There are important instructional considerations that must be taken into account to ensure student learning. Given the difficulty individuals with ASD have with acquiring skills incidentally, it is crucial to provide carefully planned and predictable instruction. Students will benefit from direct teaching of skills and concepts as well as strategies to encourage active engagement. Instructional considerations that make teaching effective capitalize on learning strengths and interests to compensate for predictable learning problems (Heflin & Alaimo, 2007).

Instructional considerations that make teaching effective capitalize on learning strengths and interests to compensate for predictable learning problems.

Table 7. Evidence-Based Instructional Strategies for Children and Youth with ASD
(Source: The National Professional Development Center on Autism Spectrum Disorders, 2009).

Evidence-based Strategy	Academics & Cognition	Behavior	Communication	Play	Social
Antecedent-Based Interventions	✓	✓	✓	✓	✓
Computer Assisted Instruction	✓				
Differential Reinforcement		✓	✓		✓
Discrete Trial Training	✓	✓	✓	✓	✓
Extinction		✓			
Functional Behavioral Assessment		✓	✓		
Functional Communication Training		✓	✓		
Naturalistic Intervention			✓	✓	✓
Peer Mediated Instruction			✓		✓
Picture Exchange Communication Systems (PECS)		✓	✓		✓
Pivotal Response Training	✓	✓	✓	✓	✓
Prompting Procedures	✓	✓	✓		
Reinforcement	✓	✓	✓		
Response Interruption/Redirection	✓	✓			
Self-Management	✓	✓	✓	✓	✓
Social Narratives	✓	✓	✓	✓	✓
Social Skills Groups			✓		✓
Speech Generating Devices (Voice Output Communication Assistance, VOCA)			✓		
Stimulus Control	✓	✓			
Structured Work Systems	✓			✓	
Task Analysis	✓	✓	✓		✓
Time Delay	✓		✓	✓	✓
Video Modeling	✓		✓	✓	✓
Visual Supports	✓	✓	✓	✓	✓

Systematic Instruction

Systematic instruction refers to instruction that is carefully planned and orchestrated (Wolfe & Neisworth, 2005). It requires educators to clearly state a teaching objective and follow a defined instructional sequence. When providing systematic instruction, the following questions should be carefully considered for each skill targeted:

1. How is the skill defined?
2. What are the steps for teaching the skill?
3. How will instruction be delivered?
4. Where and when will instruction take place?
5. What prompting / cueing will be used to teach the skill?
6. What reinforcers will be used to provide motivation?
7. What will happen when the student responds correctly? Incorrectly?
8. How will progress be measured?
9. When will it be known when the student has achieved the skill?
10. What is the next step?

Maximizing learning opportunities creates the foundation for the instructional process. Systematic instructional episodes involve:

- *pacing* a lesson appropriately
- allowing adequate *processing* time
- providing *feedback*
- providing skillful *error correction* procedures
- encouraging frequent student *responses*
- providing sufficient *practice* opportunities
- *monitoring* throughout a lesson.

Systematic instruction is organized and follows a logical order. The sequence proceeds methodically from the easiest and most basic elements to more difficult and complex material. This may require educators to break complex tasks down into subtasks and teach in small, manageable steps.

It is important to remember, while the premise of instruction is to teach in a sequential order, students with ASD may have highly developed skills in one area and be delayed in another. Further, as students age, their educational needs will change. Educators should be careful not to assume instruction should be provided according to standard developmental markers or in a conventional progression. It may be beneficial for many not to teach in a direct linear fashion but instead to teach based on the actual needs and strengths of the student.

Intensive Instruction

Intensive instruction is needed to address the multitude of needs and must be carefully matched to the student. Many will require intensive instruction in all learning domains. At a minimum, students, regardless of category, will require intensive instruction in language and social functioning (NRC, 2001).

When planning intensity of instruction, the first thing often thought of is the amount of instruction provided. This is an important consideration for educators as it is generally agreed that more intervention produces better outcomes (Lovaas, 1987; NRC, 2001; Nelson & Huefner, 2003; Wolfe & Neisworth, 2005). While quantity of instruction is a critical component of intensity, a more important factor is quality of the instruction. The NRC recommended students with ASD receive 25 hours of instruction per week across the entire year; however, instruction must be systematic and intensive for it to be meaningful. One of the challenges educators

One of the challenges educators face is ensuring all learning activities provide the type of instruction that will result in active engagement of the student and progress towards goals. Educators must plan for the implementation of intensive instruction across the myriad of school activities rather than expect students to become engaged with or learn from typical learning experiences.

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Instructional Format

Instruction may be provided through a full range of formats. These include one-to-one instruction, small group instruction, student-initiated interactions, teacher-initiated interactions, and play and peer-mediated interactions. Most students will likely benefit from multiple formats. Some may be better served using the full array, while others may not benefit from a group situation with distal instruction and greater distractions. For example, a student with Asperger's Disorder in a general education classroom may learn using each format, while a student with autism may require more instructional time using one-to-one teaching. The student's learning style, especially as it relates to attending, communication skills and social functioning are core considerations when determining format.

For students requiring individual instruction, whether needed for all domains or specific areas of difficulty, delivery of instructional episodes can take place in a variety of settings. For example, instruction can take place in a situation where only the child and teacher are present or in a situation in which a child is in a group and an adult delivers an evidence-based practice within the group setting. In either case, systematic instruction is provided.

Generalization

Students with ASD have difficulty applying learned skills in new or novel situations, a concept known as "generalization." Accounting for performance of skills in natural environments should be a core component of the educational curriculum. The student's ability to generalize should be considered across a variety of circumstances: time, settings, materials, and persons. Each is explained below:

- **Time** – maintenance of the skill over time, especially after the conclusion of instruction.
- **Settings** – ability to apply the skill outside of the environment in which it was acquired, for example, in other areas of the school building or division, at home, and in the community.
- **Materials** – ability to transfer the skill to other examples of the same item.
- **Persons** – ability to apply the skill regardless of who is in the environment and with whom the student is interacting.

For many students, careful planning must occur to ensure generalization of skills. Planning should begin as soon as a skill is targeted. When assessing skill mastery, generalization should be included in data collection. The generalized environment is the final testing ground for mastered skills in intervention. The following strategies may assist in fostering skill generalization:

- Include realistic environmental features in skill instruction and teaching environments.
- Conduct skill instruction in natural environments as much as possible.
- Conduct skill instruction in a variety of settings with a variety of instructors.
- Pair skill instruction with naturally occurring, positively rewarding consequences.
- Transfer mastered skills to a variety of environments.

Modifications and Accommodations

Modifications and accommodations are tools and procedures that provide equal access to instruction and assessment for students with disabilities.

They provide necessary supports for learning, becoming independent, and demonstrating social responsibility. Although the terms modifications and accommodations are often used interchangeably, they are, in fact, separate considerations. A modification means a change in what is being taught to or expected from the student. Making an assignment easier so the student is not doing the same level of work as other students is an example of a modification. An accommodation is a change that helps a student overcome or work around the disability. Accommodations are the supports or alterations required to allow a student to demonstrate their learning or knowledge effectively. Allowing a student who has trouble writing to give his answers orally is an example of an accommodation. This student is still expected to know the same material and answer the same questions as fully as the other students, but he does not have to write his answers to show that he knows the information.

What is most important to know about modifications and accommodations is that both are meant to help a child to learn. Both can be used to help the student advance toward attaining goals, be involved and make progress in the general education curriculum, participate in extracurricular and other nonacademic activities, and participate with children without disabilities (IDEA, 2004). According to results from the National Transitional Longitudinal Study, regardless of the educational placement, most students with ASD will require curricular modifications and accommodations throughout their educational career (Levine, Marder, & Wagner, 2004). Appendix C provides a number of modifications and accommodations that address critical considerations for this group of students. This is not an exhaustive list. Further, supports will vary significantly based on the student.

When determining modifications and accommodations, special consideration must be given to the requirement of educating students with disabilities within the Least Restrictive Environment (LRE). LRE allows students with disabilities greater access to the general education classroom and curriculum. Modifications and accommodations must be provided to allow a student to successfully access the curriculum (or portions thereof) within a general education classroom as appropriate.

Related Services

Many students will benefit from a range of related services and supports (Hendricks & Wehman, 2009). According to the *2010 Regulations Governing Special Education Programs for Children with Disabilities in Virginia*, "related services" means developmental, corrective, and other supportive services that are required to assist a student with a disability to benefit from special education. Related services may include, but are not limited to:

- ✶ speech-language pathology and audiology services;
- ✶ interpreting services;
- ✶ psychological services;
- ✶ physical and occupational therapy;
- ✶ recreation, including therapeutic recreation;
- ✶ early identification and assessment of disabilities in students;
- ✶ counseling services, including rehabilitation counseling;
- ✶ orientation and mobility services;
- ✶ medical services for diagnostic or evaluation purposes;
- ✶ school health services and school nurse services;
- ✶ social work services in schools; and
- ✶ parent counseling and training.

The National Transitional Longitudinal Study found that students with ASD receive related services to address a wide range of educational issues including speech-language therapy to ameliorate language and social deficits and occupational therapy to improve activities of daily living and provide strategies for managing sensory abnormalities (Levine et al., 2004). School health services and special transportation assistance are other examples that can help eligible students participate more fully and successfully in the learning process.

Assistive Technology

Assistive Technology (AT) refers to tools and strategies that provide students with disabilities access to applications that assist with interactions and learning (VDOE, 2008). AT gives students with disabilities greater access to the general education curriculum and settings and greater possibilities to master content, interact with others, and increase independence. In addition, AT can significantly impact self-expression, self-esteem, and overall quality of life (Mirenda, 2001).

According to IDEA (2004) and the *2010 Regulations Governing Special Education Programs for Children with Disabilities in Virginia*, Assistive Technology means any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of a person with a disability. Assistive technology services refer to any service that directly assists the person with a disability in the selection, acquisition, or use of an AT device. The term includes:

1. The evaluation of the needs of a student with a disability, including a functional evaluation of the student in the student's customary environment;

2. Purchasing, leasing, or otherwise providing for the acquisition of AT devices for students with disabilities;

3. Selecting, designing, fitting, customizing, adapting, applying, maintaining, repairing, or replacing AT devices;

4. Coordinating and using other therapies, interventions, or services with AT devices, such as those associated with existing education and rehabilitation plans and programs;

5. Training or technical assistance for a student with a disability or, if appropriate, that student's family; and

6. Training or technical assistance for professionals (including individuals providing education or rehabilitation services), employers, or other individuals who provide services to employ or are otherwise substantially involved in the major life functions of that student.

Typically, children with ASD process visual information more easily than auditory information. Any time AT devices are used, information is provided through their strongest processing area (visual). Therefore, various types of technology from "no" tech to "high" tech, should be incorporated to improve the functional capabilities of students. Care must be taken to consider AT for the range of learning needs. AT considerations should not be limited to expressive communication. Below is a list of areas to evaluate when determining whether AT is required and will provide student benefit. Appendix D provides an "Assistive Technology Planning Form" which can be used to help the team identify specific areas of need.

- Writing
- Spelling
- Reading
- Mathematics
- Fine motor
- Gross motor
- Study skills / organizational skills
- Listening
- Communication
- Socialization
- Behavior
- Dressing
- Toileting
- Eating
- Sensory
- Recreation, leisure and play
- Positioning and seating
- Routines / activity completion
- Computer access

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Assistive Technology can be of different levels and complexities and can be considered no-tech, low-tech, or high-tech tools. It is not the complexity of the tool

that is the consideration, but the impact on the student. Table 8 provides examples of AT based on the level of technology. For each example provided, applicable skill areas are identified. Keep in mind, the skill areas are suggestions. AT tools and strategies may have utility beyond the areas indicated.

Table 8. Assistive Technology Examples

Tech Level	Examples of Tools and Strategies	Academic/ Writing	Comm/ Social	Activities of Daily Living	Independence	Sensory	Behavior
No-Tech	Pictures	✓	✓	✓	✓	✓	✓
	Picture Exchange Communication System		✓				✓
	Social Narrative	✓	✓	✓	✓	✓	✓
	Wait card		✓	✓	✓		✓
	Break card	✓	✓		✓	✓	✓
	Universal "No" card		✓		✓		✓
	Highlighter tape	✓					
	File folder activity	✓					
	Writing grips	✓					
	Scribe	✓					
	Topic card		✓				
	Schedule	✓	✓	✓	✓	✓	✓
	Workstation	✓			✓		
	Checklist	✓		✓	✓		✓
	Self-assessment scale or thermometer	✓	✓	✓	✓	✓	
	Therapy balls / swings					✓	✓
	Chewy items					✓	
Low-Tech	One Message Voice Output	✓	✓				✓
	Communication Aid (e.g., Key Chain Talker, Picture Frame Talker, Clip Talk) Multiple Message Voice Output	✓	✓				✓
	Communication Aid (e.g., Cheap Talk, Four Frame Talker: Go Talk) Language Master	✓	✓	✓	✓		✓
	Tape recorder	✓	✓	✓	✓		✓
	Switch (e.g., BIGmack)	✓	✓	✓	✓		✓
	Timer	✓		✓	✓	✓	✓
	Electronic reminder	✓	✓	✓	✓	✓	✓
	Watch	✓		✓	✓	✓	✓
	Speaking Speller	✓					
	Pager						
High-Tech	Voice Output Communication Aid with dynamic display or icon sequencing (e.g., Springboard, Dynavox, Tango)	✓	✓				✓
	Talking Word Processing programs (e.g., Speaking Dynamically Pro, Write: OutLoud)	✓	✓				✓
	Video camera	✓	✓	✓	✓		✓
	Computer	✓	✓			✓	
	Word Processor	✓	✓				
	Software (e.g., reading, mathematics, vocabulary, thinking)	✓	✓			✓	
	Web sites	✓	✓			✓	
	Adaptive Hardware (e.g., Touch Window, Intellikeys, track ball)	✓				✓	
	Scanner	✓					
	PDF	✓	✓	✓	✓	✓	✓
	Smart Phone	✓	✓	✓	✓	✓	✓

Augmentative and Alternative Communication

Augmentative and Alternative Communication (AAC) is a type of AT. Difficulty with communication is a critical issue for students with ASD. Communication impairments can impact an individual's ability to communicate with others (expressive communication) and/or receive communication from others (receptive communication). AAC interventions assist individuals with communication impairments to increase skills in this area and to become more competent communicators.

It is critical for educational teams to consider AAC for any student with ASD. For some students, AAC may act as the primary mode of communication. For others, it may be a secondary form. AAC may supplement or augment verbal communication providing the means for the student to communicate more effectively and efficiently. In many instances, it even fosters increased verbal communication. Research has demonstrated that AAC often results in increased verbal production (Schlosser & Wendt, 2008).

There is not one single AAC system appropriate to all students. An array of technologies and systems is available. Each draws on different skills and takes advantage of different strengths. Individuals with ASD have been successful using no-tech AAC systems such as gestures or sign language as well as concrete visual-spatial systems (e.g., photographs, pictures, written words). Technological advances in AAC have provided a "voice" to many individuals through voice output communication aids and talking word processors.

It is critical for educational teams to consider AAC for any student with ASD. For some students, AAC may act as the primary mode of communication. For others, it may be a secondary form. AAC may supplement or augment verbal communication providing the means for the student to communicate more effectively and efficiently. In many instances, it even fosters increased verbal communication. Research has demonstrated that AAC often results in increased verbal production (Schlosser & Wendt, 2008).

Choosing the appropriate AAC system depends upon a proper assessment of an individual's current level of communication, abilities, performance related to receptive communication, and his or her potential for change through instruction. Determination of AAC interventions requires a team approach and careful analysis of the student's specific communication needs. Immediacy of need for increased or improved communication is a vital consideration and may often be a decisive factor. Refer to Table 8 for examples of AAC systems.

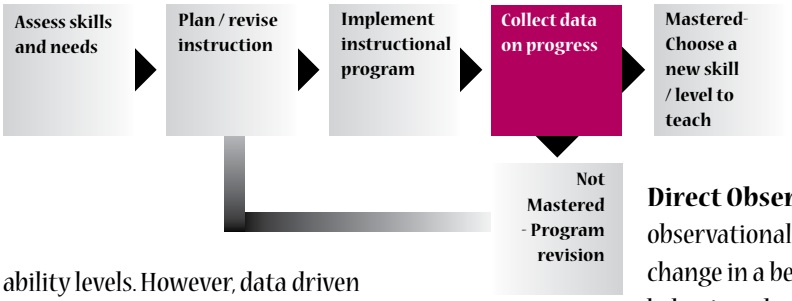
Program Evaluation

Evaluating students' progress toward reaching their individual goals is one of the most important components of educational programming that teachers and educational teams can do! Not only is monitoring student progress a legal requirement under IDEA, but it serves as the foundation of individualized educational programming. By continually evaluating if students are learning and making progress toward their IEP goals and objectives, teachers and team members can best address the students' individual needs and maximize their learning potential. It is only through close monitoring that a teacher or team member can determine whether a skill has been mastered and a student is ready for the next level or whether a student is not progressing at an acceptable rate and a program change is warranted. Through careful scrutiny, a teacher or team member can make determinations regarding implementation of all aspects of the IEP including frequency and duration of intervention.

A Framework for Monitoring Student Progress

There are many ways to monitor student progress. As discussed in the "Assessment" section of this manual, standardized tools and curriculum-based assessments can be helpful in determining students'

Figure 2. A Framework for Instructional Planning and Evaluation



ability levels. However, data driven assessments that include ongoing data collection is the most appropriate for monitoring student progress across a variety of skill areas and competencies and to determine if he or she is meeting the IEP goals. Collecting direct, systematic, and objective data on students can help to most accurately determine progress, and evaluate the effectiveness of instructional strategies.

Data-driven assessment, instructional planning, program implementation, and progress monitoring has been a long standing technique. Figure 2 above is an illustration of how this process works.

As you can see above, collecting data on progress toward achieving goals and objectives helps to inform teachers and team members whether the student has mastered the goal or if the program needs to be revised to meet the student's needs.

Getting Started

After selecting the target skills or behaviors to increase (or decrease) and designing an instructional program to teach those skills, instruction and progress monitoring begin. One of the first steps is to determine the most appropriate method to accurately measure and evaluate the change in these target skills and behaviors. Typically, there are two methods for monitoring progress: (1) a permanent product recording and (2) direct observational recording.

Permanent Product Recording. A permanent product is a means of measuring change in a behavior by evaluating a lasting product that the student has developed (e.g., completing a mathematics or spelling assignment on paper, assembly of a puzzle). Clearly, permanent products are only available for certain types of tasks/skills where the outcome is a tangible, permanent change to the environment.

Direct Observational Recording. Direct observational recording is a means of measuring change in a behavior by directly observing the behavior when it happens and recording the occurrence (or nonoccurrence) of the behavior. There are several types of direct observational recording methods that can be used depending on the behavior or skill being measured:

- Event recording: Used to measure the number of times a simple, discrete behavior occurs (e.g., raising hand, greeting)
- Duration: Used to measure the length of time the skill / behavior occurred (e.g., social interaction, out of seat)
- Latency: Used to measure the length of time elapsed between an instructional cue and performance of the skill / behavior (e.g., compliance following a teacher request)

Another important aspect of progress monitoring is measuring the amount of assistance the student may need to complete the task / skill. Instructional prompts are often used while teaching students new skills or behaviors. Thus, recording the amount of assistance required can help the teacher or team member know how independent the individual is when performing a skill.

Ways to Monitor Progress

Once a measurement system is determined, the teacher or team member will need to develop a monitoring form that can help them collect the information they will need in order to evaluate student progress toward individual goals and objectives. In general, there are several different types of progress monitoring forms that can be helpful: event recording forms, duration or latency forms, task analysis forms, running record forms,

and trial sampling forms. Samples of forms are available in Appendix A. However, to assure that these forms are useful and regularly used, the form should match the target objectives, measurement system, and context in which progress is monitored. Therefore, it may be best to adapt standardized forms to meet the unique needs of the situation and the student.

When to Monitor Progress

Progress monitoring takes time. If monitoring systems are developed and organized in a manner that is user-friendly and feasible, it is well worth the investment. Students learn all day long! And, monitoring their progress on an ongoing basis throughout the day or week is one of the most efficient means of determining whether they are meeting their goals and objectives. Progress monitoring does not need to be difficult. If progress monitoring is organized in a user-friendly and efficient manner, it can often save valuable time for teachers and team members. Often selecting when to monitor progress is determined by when targeted goals and objectives are taught. When students are beginning to work on a skill or beginning a new behavioral intervention, it is most helpful to monitor changes in their behaviors more frequently during this acquisition stage (i.e., daily). However, once a student has mastered a skill and the concern is for generalization or maintenance, progress monitoring of this skill may be less frequent (i.e., weekly). Progress monitoring need not be an arduous task. Again, one of the most important aspects of monitoring progress is to design a system that accurately reflects a student's learning and progress but also is efficient and effective for use by those collecting the data.

Summarizing Monitoring Information

Once teachers and team members have collected information about what the student has learned or the behaviors that have changed, it is important to summarize that information on an ongoing and frequent basis (i.e., daily, weekly, monthly). Summarizing the information is helpful for teachers to see learning trends and make data-based decisions regarding changes in instructional strategies (i.e., if the student is not making progress) or targeting of a new skill or behavior (i.e., if the student has mastered the skill). These types of ongoing programmatic decisions are essential for maximizing the student's potential for growth and development and teacher's use of effective instruction.

One of the most common means of summarizing progress monitoring data is to provide a visual display of the information through a graph. Graphs can be constructed by hand or on a computer. By depicting learning on a graph, teachers and team members can most easily determine the trend of the data -- that is, determine if learning is accelerating, staying level, or decreasing. Again, if progress is not being adequately made, the teacher (or team member) should adjust instructional programming or strategies accordingly.

Progress monitoring need not be cumbersome. Often this information is organized in a student notebook (by learning objective) where daily/ weekly summaries can easily be filed to examine progress over a longer time period, such as quarterly. To illustrate, a student notebook may be organized according to learning domains, such as communication, social competence, academics, self-help, and challenging behaviors. This type of individualized, systematic progress monitoring will serve as a valuable resource for the teacher and team members to evaluate the student's progress and help to communicate to the family all the accomplishments of their child.

Addressing Interfering Behavior

Some students with ASD will display challenging behavior that may interfere or be a barrier to successful inclusion and learning. Interfering behavior can take many forms and range in severity. An important aspect of educational planning is to address such behavior through conducting a Functional Behavioral Assessment (FBA) and incorporating a Behavioral Intervention Plan (BIP).

In order to change interfering behavior, it is necessary first to assess the underlying function or purpose of the behavior through an FBA. According to the *2010 Regulations Governing Special Education Programs for Children with Disabilities in Virginia*, an FBA should be conducted when a student has behavior that impedes his or her learning or the learning of peers. An FBA consists of describing the interfering or problem behavior, identifying antecedent or consequent events that control the behavior, developing a hypothesis of the behavior, and testing the hypothesis. Data collection is an important part of the FBA process and may include existing or new data as determined by the IEP team.

A BIP that addresses the function of the behavior by focusing on teaching skills or providing motivation will be more effective than plans that attempt to simply control behavior (Carr, Levin, McConnachie, Carlson, Kemp, & Smith, 1994).

As the function of the behavior becomes apparent, teams develop interventions to reduce the occurrence of the interfering behavior. Teams incorporate proactive and preventative strategies and teach functional skills that will accomplish the same outcome for the person. With this view, it is important to understand that problem behavior is not something that has to be suppressed. Instead, teams understand that behavior serves a purpose and should be appropriately replaced. A BIP that addresses the function of the behavior by focusing on teaching skills or providing motivation will be more effective than plans that attempt to simply control behavior (Carr, Levin, McConnachie, Carlson, Kemp, & Smith, 1994).

In the following sections, the steps required to implement an FBA and to create and implement a BIP are outlined. Steps of the process are adapted from the National Professional Development Center on Autism Spectrum Disorders (2009).

Conducting a Functional Behavioral Assessment (FBA)

1. Establish a multidisciplinary team. The team should minimally consist of the student's teacher(s), related service personnel, paraprofessionals, and parents. The student should also be included, if developmentally appropriate.

2. Identify the interfering behavior to be targeted. Team members identify the behavior(s) that is most problematic for the student and create a definition of the behavior by following these steps:
   a. Teams consider the following when determining whether a behavior is interfering:
      - ✧ Is the behavior dangerous to the student or others?
      - ✧ Does the behavior interfere with learning of the student or peers?
      - ✧ Does the behavior interfere with socialization?
      - ✧ Is the behavior disruptive or intense on a frequent basis?
   b. Record review, observations of the student, and/or interview of relevant people are conducted to help to identify the interfering behaviors and determine the potential variables that may be influencing the behavior.
   c. Before determining the techniques to be used to conduct a functional behavioral assessment, the FBA team defines

the problem behavior in observable and measurable terms. Description statements, such as "Jack was angry." or "Juanita had a meltdown." are subjective and unhelpful. Below are examples of concrete statements. It is essential that anyone observing the behavior is able to agree on an occurrence of a behavior, so that meaningful data can be collected.

Descriptive/Subjective Statement	Observable/Objective Statement
Max shut down	Max put his head on his table and covered his eyes.
Janell had a tantrum	Janell threw his worksheet to the floor and attempted to hit the teacher three times.
Shari was excited	Shari jumped up and down and laughed loudly.

3. Collect data regarding the variables impacting behaviors. Teams gather information needed to understand and identify the antecedent or consequent events that control the behavior and determine the function by following these steps:
   a. Gather data on the function of the behavior as well as times, places, conditions, events of possible behaviors. Also, include individuals present. Be as specific as possible when gathering data.
   b. Gather data from multiple sources so the FBA team can better understand when and where the behavior is likely to occur.
   c. Review previous and current records to gain further insight into the child, strengths, challenges, and behavioral patterns.
   d. Conduct indirect assessments. Informal and formal interviews may be used to help gather information about the behavior from multiple perspectives. Examples of formal interviews of behavior include:
      1. The Functional Assessment Screening Tool (FAST; Iwata & Deleon, 1995)
      2. Problem Behavior Questionnaire (PBQ; Lewis, Scott, & Sugai, 1994)
      3. Questions about Behavioral Function in Mental Illness (QABF-MI; Singh et al., 2006)
      4. Functional Assessment Interview (FAI; O'Neill et al., 1997)
      5. Student-Directed Functional Assessment Interview (Student-FAI; O'Neill et al., 1997)
      6. Motivation Assessment Scale (MAS; Durand & Crimmins, 1992).
   e. Conduct direct assessments. After completing the indirect assessments, a direct assessment is necessary to narrow the data and gather more specific information. Direct measures lead to a more accurate hypothesis regarding the behavior. Direct assessments consist of observing the student and collecting data on the interfering behavior. There are several considerations to be made:
      - The FBA team must determine what variables are important to assess. The collection of data must be individualized to fit the situation. Data must yield information needed to determine the precise function and maintaining variables for this particular student and problem behavior.
      - The FBA team must determine how direct assessment data will be taken. Options include:
        1. ABC data charts - The observer notes what happens right ***before*** the behavior occurs (A = the antecedent) and what happens directly ***after*** the behavior (C = the consequence). The following is an example of an A-B-C data collection chart.

A (Antecedent) *(activity / event preceding the behavior)*	**B (Behavior)** *(what the behavior looked like)*	**C (Consequence)** *(events that followed or results of behavior)*
Joe was told to line up for mathematics class.	Joe hit a peer in line.	Joe was moved to the end of the line.
Joe was told to line up for lunch.	Joe pulled a peer's hair.	Joe was moved to the end of the line.

2. Scatterplots – The observer notes instances of behaviors on a chart or grid, sometimes allowing patterns of behavior to be more quickly observed.
3. Standardized rating scales – The observer uses scales to rate the degree of severity of a behavior.

- The FBA team must determine when data will be taken. Consider taking data in a variety of settings and variety of times to best understand the variables contributing to the behavior.
- The FBA team must determine who will conduct the direct assessment and collect data.
  1. It is important that more than one person is involved in collecting data to allow for different perspectives on the behavior.
  2. It is essential that any individuals collecting data understand behavioral definitions and data collection methods.

4. Analyze the data and begin to formulate a hypothesis. Using information gathered, the team is to identify patterns of behavior across time and environments. The following steps help with data analysis:
   a. The team answers these questions:
      - ✧ How often does the problem behavior occur? How long does it last? What is the intensity of the behavior?
      - ✧ When is the behavior most likely and least likely to occur? (upon arrival? just before lunch?)
      - ✧ Where is the behavior most likely/ least likely to occur? (classroom? gym? lunchroom?)
      - ✧ In what conditions does the behavior occur/not occur? (group work? free time?)
      - ✧ Who is present when the behavior is most/least likely to occur? (certain teachers/aides? certain students?)
      - ✧ What are other students/teachers/ adults doing when the behavior starts?
      - ✧ What is the number of and proximity of other people when the behavior is likely to occur?
      - ✧ Is there anything noticeable about the environment when the behavior occurs? (consider noise levels, lighting, doors open or closed, etc.)

   b. The team considers the following items which are crucial to developing an effective intervention plan:
      - ✧ **Function** – What is the function of the behavior? What is the student communicating by demonstrating the behavior?
        1. Is the student trying to obtain something, such as attention, activities, objects, or internal stimulation? If so, what exactly is he or she trying to obtain?
        2. Is the student trying to escape or avoid something, such as attention tasks, activities, or internal stimulation? If so, what exactly is he or she trying to escape or avoid?
      - ✧ **Skill deficit** – What communication, social, adaptive, or academic skills does the student lack which might contribute to

the frequency of the behavior? For example, if a student hits a peer in a conflict situation, the student may not know how to resolve the conflict verbally. In this case, a BIP should address how the skill will be taught and supported.

- ✧ **Maintaining variables** – What are the setting events, immediate antecedents, and immediate consequences that surround the interfering behavior?

5. Develop a hypothesis. After careful analysis of all the data, create a firm hypothesis about the interfering behavior. The hypothesis will be used to drive the BIP. The hypothesis should describe:
   a. The setting events, immediate antecedents, and immediate consequences that surround the interfering behavior.
   b. A restatement and refinement of the description of the interfering behavior that is occurring.
   c. The function of the behavior.
   d. Any other relevant information, including skill deficits.
   e. Some examples of hypothesis statements include:
      - ✧ Tricia swears out loud when asked to answer a question during history class. She is most likely to do this if the question is difficult. When Tricia swears, she is taken to the principal's office. Tricia's swearing behavior is likely an attempt to escape the demand of answering a question in front of the classroom.
      - ✧ Jake screams loudly when the teacher is working with another student during morning work. When Jake screams, the teacher first tells him to be quiet and do his work, then will go to him and provide physical assistance to do his work. Jake's screaming is likely an attempt to gain attention from the teacher.

Developing and Implementing a Behavioral Intervention Plan (BIP)

1. Identify appropriate evidence-based practices that address the function of the student's interfering behavior. A comprehensive BIP will generally include several intervention strategies designed to increase positive behaviors and reduce those considered to be problems. Strategies include the following:
   a. Address areas of skill deficit. Teach the student a more acceptable behavior that serves the same function as the inappropriate behavior (also known as replacement behavior or functionally equivalent behavior). Examples include asking the teacher for help, a break, or attention or using effective self-management or coping strategies.
   b. Modify the setting events in the environment (the situations that make the inappropriate behavior more likely to occur) that will likely lead to a problem behavior. Examples include changing the seating arrangements to minimize distractions, decreasing work demands when the student has not slept the night before, or altering the sequence of academic instruction.
   c. Manipulate the antecedent events (the things that happen right before the behavior occurs). Examples include providing warnings, countdowns, or times, to assist with and signal transitions or discussing reinforcement or break options prior to presentation of a difficult task.
   d. Modify aspects of the curriculum and/or instruction. Examples include shortened instructional sessions or allowing oral, rather than written responses.
   e. Find strategies to enhance student motivation. Examples include incorporating preferred materials

into activities or allowing the learner to engage in a preferred activity when completing an activity contingent on absence of interfering behavior.

f. Modify the consequent events for the positive, appropriate, or replacement behaviors. Examples include precise praise, shaping, and reinforcing incompatible behaviors.

2. Determine the response to the interfering behavior. Different responses may need to be outlined for varying levels of the behavior. Considerations include:
   a. Modify the consequent events (the things that happen, in response to the inappropriate behavior). In many instances, teachers and other practitioners will ignore the interfering behavior when it occurs so that students with ASD are no longer reinforced for engaging in it. In some cases, delivery of consequences may be necessary. Examples include reviewing of rules, redirecting, or removal of token.
   b. In the event that problem behavior is severe or creates a safety issue, teams may also need to outline a crisis management plan to ensure safety and quick de-escalation of the behavior.

Table 9 outlines specific functions of interfering behaviors and examples of appropriate evidence-based practices that might be used to reduce

Table 9. Examples of Evidence-based Practices Included in a BIP

Function of Interfering Behavior	Prevention / Antecedent Strategies	Possible Replacement Behavior	Reactive Strategies
Gain access to item, activity, or attention	· Give noncontingent reinforcement · Give positive attention when appropriate · Set up routines and schedule reinforcing activities throughout the day · Provide reinforcement for not engaging in behavior	· Establish an appropriate response (Functional Communication Training to request item, activity, or attention)	· Extinguish behavior (discontinue reinforcement of problem behavior) · Do not provide item, activity or attention if problem behavior is present
Escape or avoid tasks/ attention	· Reduce or eliminate activities or demands that trigger behavior · Alternate tasks (i.e., number, difficulty, novelty, etc.) · Set up routines so reinforcing activities follow harder ones · Provide reinforcement for not engaging in behavior	· Establish an alternative, appropriate method of escaping the task (Functional Communication Training asking for break, termination) · Strengthen compliance and tolerance to task through behavioral momentum and task interspersal	· Extinguish behavior (discontinue reinforcement of problem behavior) · Continue to repeat the demand and do not allow access to preferred activities until task is complete
Sensory/autonomic	· Enrich the environment · Engage the student in preferred activities · Provide sensory oriented breaks · Provide reinforcement for not engaging in behavior or for engaging in alternative behavior	· Establish an alternative sensory seeking behavior that is more appropriate or less disruptive · Establish a method for the student to ask for a break or a time or place in which behavior is permissible (Functional Communication Training)	· Block

interfering behaviors.

3. Create observable and measurable objectives that can be used to measure the effectiveness of the intervention to indicate progress. The objectives can be drawn from the student's IEP or drafted when writing the BIP. Examples include:
   - ✧ Juan will complete tasks in reading group without talking.
   - ✧ If Sammy needs to leave class, he asks for a break during whole class instruction using his "Break" card.
   - ✧ When Kara hears the timer, she will transition between activities by walking directly to the next activity on her visual schedule.

4. Determine how to implement the BIP. There are numerous considerations to ensure it is implemented across environments and with fidelity. Teams must outline the following:
   a. Determine additional materials needed, such as data collection sheets, timers, visual supports, support staff, etc.
   b. Determine environmental modifications needed
   c. Identify reinforcers for the student to enhance motivation
   d. Provide information and training to all individuals who will need to implement the plan
   e. Provide training on any specific evidence-based practice that may be used
   f. Determine any additional personnel resources that may be needed
   g. Determine a safe, quiet location for the student should crisis behavior occur
   h. Determine strategies for the maintenance, durability, generality, and longevity of appropriate student behavior

5. Create a data collection plan to monitor progress. Data should be collected once a week at a minimum. Take data on both the interfering behavior as well as the new replacement behaviors. Outline when, where, by whom, and how data are collected.
   When: once a week, daily, on Tuesdays and Thursdays
   Where: during snack, on the playground, in reading group
   By Whom: special education teacher, speech-language pathologist, paraprofessional
   How: checklist, self-management checklist completed by student with ASD

6. Evaluate fidelity of the implementation of the plan. Once a BIP has been developed, it is essential that the consistency and accuracy of the implementation of the plan is monitored. Checklists, scripts, and lists can help support staff in achieving consistency. Implementation of the plan should also be observed by a team member across settings and staff to ensure accuracy.

7. Evaluate the effectiveness of the BIP. Develop a system to analyze data on a regular basis. Subsequent review of the data or student behavior is essential to determine the effects of the intervention across time.

8. Modify the BIP. Revise the BIP anytime the IEP team feels it is in need or anytime data supports an adjustment (IDEA, 2004). Ultimately, the FBA and BIP process is not complete until the team's efforts result in positive behavioral changes in student performance. The circumstances that warrant a review and/or revision include:
   a. The student has reached his or her behavioral goals and objectives and new goals and objectives need to be established.
   b. The situation has changed and the plan no longer addresses the student's needs.
   c. The IEP team determines during a manifestation determination review that the BIP strategies are not consistent with the student's IEP or placement.
   d. The BIP is not producing positive changes in the student's behavior.

Collaboration with the Educational Team

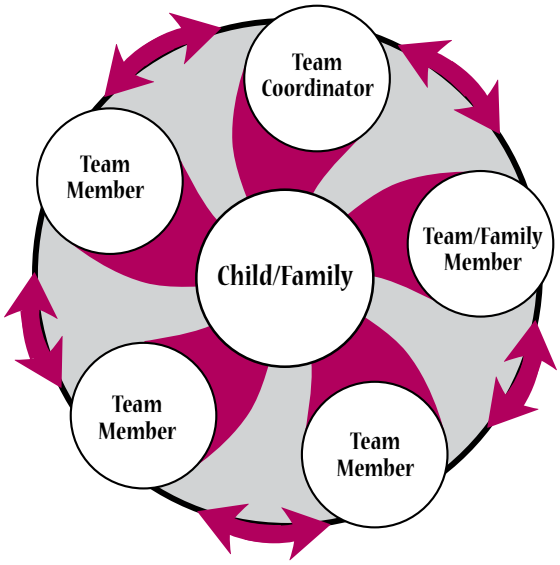
Successfully educating students with ASD requires collaboration amongst a variety of professionals and stakeholders. Friend and Cook (2007) define interpersonal collaboration as "a style for direct interaction between at least two co-equal parties voluntarily engaged in shared decision making as they work toward a common goal." There are three primary team models that currently exist in service delivery systems. The oldest and most well known is the multidisciplinary team. A multidisciplinary team provides input to team members through the team leader, often the special education teacher. The leader assimilates and directs final outcomes and recommendations. In this model, not all the team members are connected to the child and family, nor are they connected to one another except by way of the team leader. This model, while common, is not optimal for this group of students.

The second model is the interdisciplinary model. This model emphasizes team member interdependence and collaboration. Interdisciplinary teams are comprised of individuals who represent multiple disciplines that rely on one another and are equal decision-making partners. This type of model includes parents as equal members of the team in addition to professionals. A team leader, again typically the special education teacher, gathers input and facilitates decisions. This model, given the equal partnership and interdependence is much more appropriate for this population but still contains some limitations.

The third model, the transdisciplinary team model, is the model teams should strive for. This is the most newly developed type of team structure. Transdisciplinary teams work together from equal standing, train each other, and easily cross disciplinary boundaries. The transdisciplinary team uses a coordinator to facilitate the team process. Families are at the heart of transdisciplinary teams and are empowered by the collaborative process in the decision-making. Figure 3 demonstrates the transdisciplinary team process as outlined by Ogletree, Bull, Drew, & Lunnen (2001). The large size of the center circle with the child and family represents their importance to this team structure. There is an absence of disciplinary boundaries of team member circles. The two bidirectional lines connecting the team member and coordinator to the family demonstrate the significance of indirect services. The lines connecting the team members to one another imply the significance of interdependent training and collaboration.

For these students, additional meetings designed to share successes and problem solve may be needed.

Figure 3. Transdisciplinary Team Model



Team Meetings

Team meetings should be held on a regular basis. Of course, IEP meetings are to be held at a minimum of once a year, however, for these students, additional meetings designed to share successes and problem solve may be needed (Gabriels & Hill, 2007). Keep in mind that the student with ASD is typically not sharing important educational information with his or her parents. Therefore, the team must meet as often as needed to ensure families are informed and

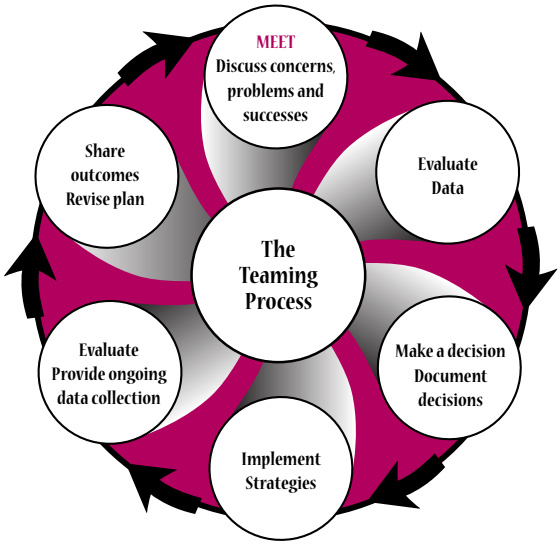
appropriate services and supports are being provided. There are a number of recommendations for helping meetings be productive and collaborative:

- ✶ Do not wait until there is a problem to have a meeting.
- ✶ Send home a draft agenda for each meeting allowing time for parents to add their needs and concerns.
- ✶ Be on time to the meeting and sit next to the parent.
- ✶ Provide positive comments and highlight progress made.
- ✶ Show the parents the meeting is important to you and avoid giving the impression that you have other more pressing matters to attend to.
- ✶ Ask parents for input throughout the meeting not just at the beginning and end.
- ✶ Share progress information in a format easily understood by the parents.
- ✶ Invite parents to come to the school to review the data and assessments or observe.
- ✶ Invite parents to meet one-on-one to discuss progress or concerns.

During the teaming process it is essential for all members of the team to provide input and for input to be documented. It is especially critical that documentation is provided regarding the decisions that have been made as well as the strategies and steps needed for implementation. Everyone at the table should leave the meeting knowing what is to be done, by whom, and by when. It is helpful to outline timelines for completion of specific components. If questions arise, the documentation is essential to clarifying roles, responsibilities, and any misconceptions about the events at the meeting.

Prior to concluding the meeting steps should be taken to address how the team will follow-up on decisions made. Scheduling a follow-up meeting is always a good plan to ensure the team can come together at a mutually specified time. Other ways to follow up include checklists of steps completed, sharing data, and phone calls. Appendix E provides an example of a Team Planning Form. The teaming process should go as follows:

Figure 4. The Teaming Process



The optimal education experience for families and teachers alike is one with minimal conflict. However, in working together, conflict will arise from time to time. It is essential to use proactive strategies to minimize conflict as much and as soon as possible. Boutot and Myles (2011) outlined the following strategies to be implemented to resolve conflict in the educational setting.

- ✶ Upon discovering there is an issue or a potential issue, arrange a meeting as soon as possible with all involved parties.
  - ❋ Schedule a meeting rather than addressing conflict on the fly. This allows time to investigate the problem and prepare for it.
  - ❋ Keep written documentation of any meeting or conversation involving a conflict.
  - ❋ VDOE offers mediation services to parents and school personnel to resolve

disputes before the issue escalates to a level where collaboration is threatened. Information regarding these services is available at VDOE's Web site: ***http://www.doe.virginia.gov/special_ed/resolving_disputes/index.shtml***

- ✶ Give all parties the opportunity to share concerns. Listen with an open mind.
- ✶ Give all parties the opportunity to share steps to resolve the conflict and give consideration to all those that are within the school and division policies.
- ✶ Make a plan for resolution and create a list of responsibilities for each action to be taken including steps to be taken, by whom, and the time frame.
- ✶ End the meeting on a positive note by stating something positive about the child.
- ✶ Follow up the meeting with a phone call, e-mail, or note expressing appreciation for the opportunity to discuss the issue and reiterate actions to be taken.
- ✶ Keep data on the actions as they are accomplished and share with the parent and IEP team.
- ✶ Schedule a follow-up meeting after all actions have been completed or if actions need revision in order to achieve success.

Family Members

Developing and maintaining collaborative working relationships with the family is a necessary component of designing and implementing successful educational programs. Family members can be the most stable, influential and valuable people in a student's environment. Family members are often the first to recognize that a student may have an ASD. From recognition and diagnosis to getting services families face insurmountable numbers of challenges. Navigating the medical and educational field can be taxing on families, especially those new to the diagnosis. Further, the family dynamic is often challenged by a child with ASD, impacting siblings and extended family members. It is essential that educational professionals support and acknowledge the difficulties faced by the family and be sensitive to the comprehensive family unit. As educators, we must respect and support the level of involvement in the educational program families can contribute with consideration given to the range of obligations and demands they are faced with on a daily basis (Dunlap, 1999).

The pervasive nature of ASD and difficulties generalizing from school to home and community environments make parents essential partners in the educational process.

The pervasive nature of ASD and difficulties generalizing from school to home and community environments make parents essential partners in the educational process. It is necessary to include and support the family through multiple means. Communication regarding the student's educational programming, progress, and daily accomplishments is often welcome and enlightening. Sharing resources and information can provide much needed direction and help maintain a working relationship. An example of a Home-School Communication Form is provided in Appendix F.

Parents can enhance involvement in their child's education by engaging in activities at home. Many learning opportunities naturally occur at home or when the family is in the community. Providing information and training to parents can increase the skills of the student as well as improve family functioning. Remember, that while training and support may be offered, it is the family's discretion on their level of involvement. It is the role of the educator, however, to help the family with this endeavor should they choose to participate. It is also important to remember that families will require different levels of assistance to carry over educational strategies in the home. Supports and training initiatives must be individualized.

Educators can foster family knowledge and involvement in many ways. The National Autism Center (NAC, 2009) identified strategies to address parent needs and maintain involvement. They are presented in Table 10.

Related Service Personnel

The core deficits and secondary characteristics of the disorder often rely on the specialized services of speech-language pathologists, occupational therapists, physical therapists, in addition to educational personnel. The nature of these services depends on the needs of the individual. The role of related service personnel is multifaceted. They are specialized in their profession and target specific aspects as outlined in the IEP. They also serve as collaborators and develop strategies and methods to assist the teacher in providing ongoing services in the absence of the related service personnel. Related service personnel also collaborate with each other to target skills that influence other major areas. For example, a speech therapist and an occupational therapist may work together to develop and implement a plan to assist a student with oral motor challenges. Additionally, as members of the IEP team, the related service personnel collaborate and assist families in their specialized areas. Collaboration among service providers ensures consistent programming among all.

Paraprofessionals

Typically, programs supporting the education of students with ASD are more saturated with paraprofessional support than other programs or disability categories (Hess, Morrier, Heflin, & Ivey, 2008; Simpson, 2003). Paraprofessionals who directly work with these students provide considerable information and insight regarding the student's daily educational experiences and abilities. Paraprofessionals should be considered a team member and should be included in discussions and collaborative efforts. Often, it is the paraprofessional who observes and supports the student in multiple environments, such as the general education classroom, music room, and cafeteria, making their input invaluable to the educational process.

Table 10. Strategies for Maintaining Parent Involvement *(adapted from NAC, 2009)*

Opportunities for Maintaining Parent Involvement	Opportunities to Consider
Informal meetings	
Formal meetings	
Information sharing	
Volunteering	
Advisory board	
Information gathering forms	

Case Studies

Below are three case studies of students with ASD. These examples offer descriptive accounts and outline the curricular considerations for each. Case examples are to be used only to exemplify a point or illustrate a practice and are not to be directly replicated.

Case Study: Classic Autism Ben, Age 4

Ben is a four-year-old boy who was diagnosed with an ASD (Autism Spectrum Disorder) at two years and six months. Ben has significant language delays; only recently has Ben begun to imitate vocal sounds, but he has never executed a formed word. Ben's inability to communicate his wants and needs likely contribute to aggressive behaviors toward others, including biting, hitting and scratching. Ben's social skills are described by his parents and teachers as limited. Ben will spontaneously make eye contact during mealtimes and social play, but rarely makes eye contact other times, even when his name is called. In his preschool class Ben is able to engage in parallel play with peers with prompting from an adult. Ben has emerging play skills and is beginning to engage with a variety of cause-and-effect toys. When the play area becomes too loud, Ben will often place his hands over his ears and hum, possibly indicating a sensory sensitivity to sound. Unlike many children with autism, Ben does not seem to have any challenges with food. He eats a variety of foods, but needs assistance utilizing his spoon and fork and remaining at the table through the duration of the meal. During instructional activities, Ben needs prompts to attend and participate. He will often engage in self-stimulatory behaviors which include flapping, spinning, and high pitched squeals. Ben enjoys shaking his favorite beaded necklace, watching videos, watching computer games, and eating chips.

Focus Areas for Intervention

- Joint attention
  - Orient, attend, and respond to adult and peer activities
  - Display nonverbal social cues
    - Gestures – point
- Social interactions and social reciprocity
  - Turn take with concrete games and activities
- Relationships
  - Engage and interact with family members
  - Engage and interact with adults
- Motivation to communicate
  - Communicate regarding personal needs and interests
  - Function of communication
  - Respond to name
  - Follow instructions
  - Terminate
  - Negate
  - Gain assistance
  - Expand use and understanding of vocabulary
    - Nouns
    - Verbs
- Interpret and use spoken language
  - Vocalizations (voice without conventional words)
  - Verbalizations
  - Words
- Interpret and use AAC
  - Communicate / supplement communication through sign language
  - Communicate / supplement communication through picture exchange
- Toy / activity play skills
  - Engage in exploratory play (e.g., sandbox, cause-and-effect)
  - Engage in constructive play (e.g., blocks, train tracks, models)
- Toileting
  - Urinate in toilet

- Personal hygiene
  - Wash hands
- Dressing
  - Manage jacket / coat
  - Manage pants
  - Manage shoes
- Eating
  - Feed self
  - Sit at table for duration of meal / snack
  - Drink from open rimmed cup
  - Eat with spoon, proper handling, scooping
- Schedules
  - Follow schedule
  - Follow visual sequence
  - Accept changes in routines / schedules
- School, home, and community independence
  - Complete routines
  - Complete tasks independently
  - Display appropriate behavior in car / on bus
- Fine motor
  - Manipulate objects (e.g., twist, pull, turn pages)
  - Transfer objects between hands
  - Demonstrate bilateral coordination
- Attending
  - Sustain attention with task
- Imitation
  - Copy motor actions
  - Copy verbalizations / words
  - Copy actions with objects

Curriculum Framework

Ben is only four years of age so the curriculum framework is not a consideration at this time. Ben's current teacher will work with his receiving educational team as he enters kindergarten to ensure they have a thorough understanding of Ben, his strengths and need, and will provide an appropriate curriculum.

Assessment and Goal Development

Standardized Assessment

Ben underwent the Eligibility process at age 3. At that time, a variety of standardized assessments were performed. As Ben's teacher prepares for the start of the school year, she reviews the results of the testing and carefully reads all descriptions of the testing process as she knows standardized testing results must be considered with caution. Ben has high levels of self-stimulatory behavior and attends for short periods of time. Such factors may have influenced the results. Through her reading, she learns that the team conducted testing in short intervals lasting no longer than 15 minutes, modified some of the directions to better suit Ben, and also used reinforcement to keep him motivated. Ben's teacher feels the results are indicative of Ben's abilities and determines not to conduct further standardized testing at this time.

Data-driven Assessment

Ben's teacher wants to ensure he is provided an appropriate education. She has his IEP goals and objectives, but wants to make certain it addresses his individual needs. She determines that a data-driven assessment will provide useful information as it will help her and the team to fully understand Ben's strengths, needs, and abilities as they occur in the natural environment. During the first week of school, Ben's teacher sets up multiple opportunities to observe his skills. She also interviewed the teacher he had last year and the speech therapist, reviewed data from that school year, and read his quarterly reports. Based on the information obtained, she was able to put together an appropriate program that incorporates goals related to increasing functional communication, play skills, social interactions, time on task, and adaptive daily living skills.

Educational Environment - Placement and Services

Partial-Day Self-Contained Special Education Class with Mainstreaming Opportunities in General Education Kindergarten Class.

Ben receives speech language therapy three times per week. 60 minutes is direct, individualized instruction while 30 minutes is integrated with other students.

Ben receives occupational therapy one time per week. 30 minutes is direct therapy. The OT provides an additional 15 minutes of consultation to his teacher.

There are six students in the self-contained class. The class is supported by one teacher and two paraprofessionals.

Ben participates in the general education classroom during the following times:

- ✶ Reading Rotations
  - ❋ Small group reading with general education teacher - Ben works on identifying objects and actions while kindergarten students work on reading
  - ❋ Partner reading – Kindergarten student reads to Ben and offers Ben choices and opportunities to request
  - ❋ Letter center – Ben takes turns with a letter matching activity with a peer while the peer provides assistance
    - ✧ Recess
  - ❋ Ben's class attends recess with the kindergartners and Ben is paired with a peer volunteer during 15 minutes of recess

Environmental Organization and Structure

A variety of environmental modifications and structure is provided to increase Ben's understanding and independence. Supports include:

- ✶ Visual supports used for beginning a work task, transitioning to the bathroom, and identifying where to stand in line to exit the room
- ✶ Bookcases create a boundary around the computers and quiet area
- ✶ Individual work area is set up in the corner of room
- ✶ Picture schedule depicts two daily activities at a time
- ✶ Mini-schedule is used for preparing for lunch, unpacking, and packing
- ✶ Routines are consistent throughout the day creating a predictable schedule
- ✶ Timers and verbal warnings indicate termination of a preferred activities
- ✶ Token reinforcement board used for work tasks

Instructional Considerations			
Focus Areas	**Strategies**	**Formats**	**Evaluation**
Joint attention Social interactions Relationships Imitation	· Natural interventions · Reinforcement · Peer mediated intervention	1:1 and 1:2 instruction	Data collected 2 sessions per week
Motivation to communicate Respond to name Follow instructions Communication skills Vocabulary expansion	· Natural interventions · Functional Communication Training · AAC · Picture Exchange Communication System · Discrete trial training	1:1 instruction	Data collected daily
Toy / activity play skills	· Natural interventions · Prompting · Reinforcement · Response interruption / Redirection	1:1 and 1:2 instruction	Data collected 2 sessions per week
Toileting Personal hygiene Dressing Eating	· Reinforcement · Task analysis · Prompting · Discrete trial training	1:1 instruction	Data collected daily
Schedules Independence Attending	· Antecedent based interventions · Task analysis · Structured work systems · Reinforcement	1:1 and 1:2 instruction	Data collected 2 sessions per week
Fine motor	· Prompting · Reinforcement · Natural interventions	1:1 and 1:2 instruction	Data collected 1 session per week

Assistive Technology and Augmentative and Alternative Communication	Modifications and Accommodations
Pictures Picture Exchange Communication System Schedule Workstation Therapy balls / swings Timer One Message Voice Output Touch Window	Short movement breaks between activities Quiet independent work area Minimized auditory and visual distractions Quiet area in room Touch Window Adaptive cup and eating utensils Tangible item or activity for positive reinforcement Token board Motivating sequence of events Choices Peer tutors Verbal and visual cues regarding transition Timer for terminating a preferred activity Daily schedules Mini schedules Visual supports for understanding and independence Oral-motor chew items

Case Study: Autism (mid- spectrum) Tomeika, Age 6

Tomeika is a six-year-old student who was diagnosed with ASD at the age of four. Tomeika has been able to remain included in a general education first grade classroom with the assistance of an instructional aide who provides support to her and one other student. Tomeika is verbal, but typically speaks in three to four word sentences. She uses communication primarily to request wants and needs. She will, on occasion, make comments and will answer basic what, who, and where questions. She can follow most one step directions but struggles with completing multiple steps. Tomeika will greet both adults and peers with minimal prompting. She responds to adults consistently and will even initiate interactions, but often does not respond to the social bids presented by her peers. Tomeika plays appropriately with many toys and demonstrates emerging skills in socio-dramatic play. Negative behaviors such as screaming and crying may occur when presented with an activity that involves turn taking and/or sharing. Tomeika has a poor ability to recognize and express emotions. This can be a major communication and socialization challenge as she struggles with exhibiting frustration appropriately as well as accepting signs of displeasure in others. Tomeika does engage in self-stimulatory behavior which includes chewing on her hair. Tomeika is completely toilet trained. She is able to manage her own clothing in the bathroom. Tomeika is able to read at a first-grade level and is able to use phonics for both reading and writing. She struggles with mathematics but has recently started performing basic addition with manipulatives.

Focus Areas for Intervention

- Joint attention
  - Initiate social attention with adult and peer
  - Maintain attention with joint object
- Nonverbal interaction
  - Display nonverbal social cues (body orientation, gestures)
- Emotional understanding
  - Recognize emotional states in self
- Social interactions and reciprocity
  - Respond to social cues and initiations
  - Initiate interactions
  - Continue with back and forth interaction
  - Turn take with concrete games and activities
- Relationships
  - Engage and interact with peers
  - Group / Activity participation
  - Share materials
  - Wait
  - Turn take
  - Follow group directions
- Communication
  - Communicate regarding social interests
  - Expand use and understanding of vocabulary
    - Nouns
    - Verbs
    - Descriptors (adjectives)
    - Functions
  - Gain assistance
  - Answer yes/no
  - Answer questions
  - Use sentences when communicating
  - Improve conversational skills
- Play
  - Engage in pretend / dramatic play
  - Engage in interactive / cooperative play
- Independence
  - Manage, prepare, and organize materials
  - Complete tasks independently
  - Stay in seat for appropriate periods of time
  - Clean up
  - Put away personal possessions

- ✶ Cognitive
  - ❋ Sustain attention
  - ❋ Understand concepts related to time
  - ❋ Understand past, present, and future
  - ❋ Sequence
  - ❋ Retell activities / events
  - ❋ Retell stories
  - ❋ Sort objects
  - ❋ Categorize objects
  - ❋ Plan and execute steps of activity or task

- ✶ Academic
  - ❋ General education kindergarten curriculum

Curriculum Framework

Tomeika accesses the general curriculum at this time. Tomeika excels at reading, but her team understands the difficulty she has with mathematics. They plan to continue with the general curriculum at this time with modifications in mathematics, but will carefully monitor her progress to ensure this remains appropriate.

Assessment and Goal Development

Curriculum-Based Assessment

At the end of the last school year, Tomeika's teacher conducted the Verbal Behavior Milestones Assessment and Placement Program. Her teacher will conduct this assessment again at the end of her first-grade year. The team uses the results to drive IEP goals and to ensure she is progressing in such skills as communication, motor imitation, social, and group and classroom skills.

Data-driven Assessment

Tomeika's teacher uses data-driven assessments to evaluate her work habits including attending and ability to perform tasks independently. She also uses data-driven methods to assess her use of language and communication in the natural environment.

Educational Environment - Placement and Services

General Education with Special Education Support Services in a First-Grade Classroom and Pull Out in a Resource Room.

Tomeika is in the first-grade classroom the majority of her school day. She goes to a special education resource room to participate in a social skills group two times per week and to receive individualized instruction in mathematics for 15 minutes a day. Tomeika receives speech language therapy two times per week. 30 minutes is direct, individualized instruction while 30 minutes is integrated with other students.

She receives occupational therapy one time per week. 30 minutes is direct therapy. The OT provides an additional 15 minutes of consultation to her teacher.

Environmental Organization and Structure

A variety of environmental modifications and structure is provided to increase Tomeika's understanding and independence. Supports include:

- ✶ Visual supports used to help with sharing materials and turn taking
- ✶ Visual rule card is provided during cooperative activities
- ✶ Text schedule depicts her entire sequence of daily activities
- ✶ Mini-schedule used for packing to go home, going through the lunch line, completing art projects, and recess
- ✶ Routines are consistent throughout the day creating a predictable schedule
- ✶ Timers and verbal warnings indicate termination of a fun activity
- ✶ Behavior chart is used for work tasks to evaluate time on task

Instructional Considerations			
Focus Areas	**Strategies**	**Formats**	**Evaluation**
Joint attention Social interactions Relationships Cooperative play	· Natural interventions · Reinforcement · Peer mediated intervention · Antecedent based interventions · Visual supports · Social narratives · Social skills group	Small group instruction	Data collected 2 sessions per week
Communication Conversational skills	· Natural interventions · Pivotal response training · Visual supports	1:1 and small group instruction	Data collected daily
Emotional understanding	· Natural interventions · Pivotal response training · Computer assisted instruction	1:1 and small group instruction	Data collected 2 sessions per week
Group activity participation Independence	· Natural interventions · Prompting · Reinforcement · Response interruption / Redirection	Small and whole group instruction	Data collected 2 sessions per week
Cognitive Academic	· Reinforcement · Prompting · Discrete Trial Training · Task analysis	1:1 and small and whole group instruction	Data collected 2 sessions per week

Assistive Technology and Augmentative and Alternative Communication	Modifications and Accommodations
Pictures Computer and software Schedule Timer Intellikeys Social narrative Checklist Topic card	Short movement breaks between activities Modified assignments Assignments broken into small parts Manipulatives for mathematics Written directions Vocabulary file Quiet area in room Adapted computer equipment Social praise and activities for positive reinforcement Token board Rule card Motivating sequence of events Choices Peer tutors Verbal and visual cues regarding transition Timer for terminating a preferred activity Daily schedules Mini schedules Visual supports for understanding and independence Oral-motor chew items

Case Study: Asperger's Disorder Zack, Age 8

Zack was diagnosed with Asperger's Disorder one year ago at age seven. He has had a diagnosis of Attention Deficit Hyperactivity Disorder since the age of four. However, his parents became increasingly concerned with his social isolation, inability to adapt to even simple schedule changes, and clumsiness. Zack is articulate and formal with his speech and has an impressive vocabulary. His voice fluctuation is irregular, however, as he often talks very fast and in a monotone manner. Zack has difficulty understanding the gestures and facial expressions of others as well as identifying their emotional state. This creates tremendous difficulty with his ability to respond to others appropriately. Zack has an impressive memory and is extremely knowledgeable in his favorite subject, oceanography. His fixation on ocean life often inhibits his ability to interact appropriately with peers. Zack is in the top group in his class for mathematics and reads on grade level. Recently, his teacher has seen him struggle with reading comprehension. Prediction and making inferences are especially problematic. For the most part, Zack is independent in the classroom but often has difficulty organizing materials and being ready for instruction. He is observed still putting away supplies when the teacher is ready to start a new subject. Homework is a particular challenge as he often does not write down the assignment, take home the correct materials, or return it to school. Zack has a difficult time completing group assignments which require collaboration. He does not want to listen to the opinions of his peers and believes his answers are the only correct option. Zack has challenges in the area of handwriting and often becomes frustrated when he has to write long passages. This frustration often results in Zack refusing to work and engaging in disruptive activities.

Focus Areas for Intervention

- Nonverbal interaction
  - Display and understand nonverbal social cues
- Emotional understanding
  - Recognize facial expressions
  - Recognize emotional states in self and others
  - Recognize conditions which elicit emotional states
- Self-regulation
  - Identify behavior
  - Select and implement appropriate coping strategy
- Social Interactions
  - Take turns in conversation
  - Converse on multiple topics
- Relationships
  - Engage and interact with peers
- Group / Activity participation
  - Attend to others
  - Listen
  - Turn take
  - Identify and follow social rules
- Communication
  - Improve conversational skills
- Perspective taking / Theory of mind
  - Interpret environmental cues
  - Interpret personal cues
  - Interpret emotional responses
- Independence
  - Manage, prepare, and organize materials
- Fine motor
  - Write
  - Type
- Cognitive
  - Understand others' perspectives
  - Understand nonconcrete or visual concepts (e.g., ideas, beliefs)
  - Understand cause-and-effect as it relates to ideas, beliefs, emotions

- Understand figurative language, jokes, sarcasm
- Predict
- Make inferences
- Plan and execute steps of activity or task

✶ Academic
- General education curriculum

Curriculum Framework

Zack accesses the general curriculum. His teacher is meeting with Zack's parents to discuss the possibility of having him tested for the gifted program.

Assessment and Goal Development

Standardized Assessment

Standardized testing will be conducted to assess Zack's performance in cognition, processing, academic achievement, speech, language and communication, and adaptive behavior.

Data-driven Assessment

The speech language therapist will conduct standardized testing to assess his abilities in this area; however, he knows that standardized testing will not provide an accurate look at Zack's social functioning and pragmatic communication skills in the classroom and throughout the school. The speech language therapist, therefore, conducts data-driven assessments. He gives a checklist to Zack's mother and teacher to complete. He also conducts three observations in the classroom.

Environmental Organization and Structure

A variety of environmental modifications and structure is provided to increase Zack's understanding and independence. Supports include:

✶ Visual rule card is provided during cooperative activities

✶ Self-management chart is used to evaluate performance in cooperative activities

✶ Text schedule written in a smart phone depicts the entire sequence of daily activities

✶ Materials are organized, color coded, and stored in a bin next to his desk for easy access

✶ Work area is on the end of the row to provide extra space

Instructional Considerations

Focus Areas	Strategies	Formats	Evaluation
Social interactions Relationships Nonverbal Communication Conversational skills	· Natural interventions · Prompting · Reinforcement · Peer mediated intervention · Video modeling · Social narratives · Social skills group	Small and whole group instruction	Data collected 2 sessions per week
Emotional understanding Perspective taking	· Natural interventions · Computer assisted instruction · Visual supports · Social skills group	1:1 and small group instruction	Data collected 2 sessions per week

Instructional Considerations *continued*			
Focus Areas	**Strategies**	**Formats**	**Evaluation**
Group activity participation Cooperative work Self-regulation	· Natural interventions · Prompting · Reinforcement · Response interruption / Redirection · Self-management	Small group instruction	Data collected one session per week
Independence	· Task analysis · Visual supports	1:1 and whole group instruction	Data collected one session per week
Fine motor	· Prompting · Reinforcement · Self-management	1:1 and whole group instruction	Data collected one session per week
Cognitive Academic	· Reinforcement · Prompting	Small and whole group instruction	Data collected with the other general education students

Assistive Technology and Augmentative and Alternative Communication	Modifications and Accommodations
Pictures Computer and software Schedule Writing grips Social narrative Checklist Topic card Video camera Word processor Smart phone	Directions on assignment highlighted Copy of lecture notes provided Social praise and activities for positive reinforcement Rule card Peer tutors Smart phone for schedule and to assist with material organization Daily schedule Storage bin for materials Color coded materials Word processor for writing assignments Extra set of materials at home Long-term assignment outline Behavior chart for self-management activities Emotion indicator scale Specific seating assigned in classroom, cafeteria, and music room

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APPENDICES

APPENDIX A:
Data Driven Assessments / Data Collection Forms

Frequency of Behavior Recording Form

In the form below, indicate the total amount of time of the observation and the total number of times the behavior occurred.

Student Name: **Observer**:

Date(s):

Learning/Behavioral Objectives

Total Time of Observation	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
Frequency of skill/behavior					
Total Number of Behavior (Rate)					

Sample Duration Recording Form

In the form below, indicate the total amount of time observed, when the behavior begins and the time that the behavior ends. Summarize the total amount of time the behavior occurred during the observation by using the index "percentage of time."

Student Name: **Observer**:

Date(s):

Learning/Behavioral Objective:

Length of Session	**Start**	**Stop**	**Percentage of Time**
Total			

Sample Prompt Delivery Progress Monitoring Form

In the form below, indicate the activity observed. Record the level of prompting required to complete the behavior.

Date(s):

Student:

Instructor:

Activity	Objective # 1	Objective # 2	Objective # 3

\+ = Completed skill independently
vp = Completed skill with verbal prompt
pp = Completed skill with physical prompt
\- = Did not complete

APPENDIX B:
Evidence-Based Instructional Strategies for Children and Youth with ASD

Source: *The National Professional Development Center on Autism Spectrum Disorders (2009)*

Antecedent-Based Interventions (ABI)

Skills or intervention goals addressed
ABI are most often used with students who exhibit interfering behaviors, especially self-injurious, repetitive, and stereotypical behaviors. ABI are also used to promote on-task behaviors.

Overview
ABI are a collection of practices in which environmental modifications are used to change the conditions in the setting that prompt a student to engage in an interfering behavior. The goal of ABI is to identify the conditions in the setting that are reinforcing the interfering behavior and then to modify the environment or activity so that the environmental conditions no longer elicit the interfering behavior.

This practice is most often used after a Functional Behavioral Assessment (FBA) has been conducted to identify the function of the interfering behavior. ABI strategies often are used in conjunction with other evidence-based practices such as functional communication training (FCT), extinction, and reinforcement.

Step 1. Identify the Interfering Behavior
Identify the behavior for a student with ASD that is interfering with learning (e.g., self-stimulation, self-injurious,). Typically, educators complete a Functional Behavioral Assessment to identify the function of the interfering behavior.

Step 2. Collect Baseline Data
Collect baseline data to determine how often the student is currently engaging in the interfering behavior.

Step 3. Implement ABI
Identify and implement one of the following ABI strategies that directly addresses the function of the interfering behavior:

1. use highly preferred activities/items to increase interest level;
2. change schedules/routines;
3. implement pre-activity interventions (e.g., provide a warning about the next activity, provide information about instruction);
4. use choice-making;
5. alter how instruction is delivered; or
6. enrich the environment to provide access to sensory stimuli that serve the same function as the behavior (e.g., fidget toy, objects that require motor manipulation).

Table 11. Descriptions and Examples of ABI Strategies

ABI Strategy	Description	Functions addressed	Examples
Use student preferences	Tasks/activities are modified to increase interest.	Escape/ avoid	· Incorporate dinosaurs into mathematics activity · Use Spiderman notebook for journal entries
Alter the environment	Routines and schedules are changed to decrease interfering behaviors.	Escape/ avoid	· Change seating · Change line-up procedures · Provide activities during wait time · Provide snack after nonpreferred activity · Clearly mark areas of the classroom (e.g., work, leisure) · Provide timer during nonpreferred tasks

Table 11. Descriptions and Examples of ABI Strategies *continued*

ABI Strategy	Description	Functions addresse	Examples
Implement pre-activity interventions	Intervention is implemented before a task associated with the interfering behavior.	Escape/ avoid	· Provide warning about upcoming activity · Go over assignment before class starts · Provide information about schedule changes · Use activity schedules
Use choice-making	Choice of materials or tasks is offered during times when interfering behavior occurs.	Escape/ avoid	· Choose where to sit at snack · Choose which activity to complete first · Choose toy to play with during free play · Choose writing tool
Alter how instruction is delivered	Instruction is modified so student clearly understands what is expected.	Escape/ avoid	· Provide written rather than verbal instructions · Provide instructions in a checklist rather than paragraph · Require completion of fewer problems
Enrich the environment	Access to appropriate behaviors (rocking chair) is provided.	Get/obtain	· Allow quiet play with clay or doodling during lectures · Allow chewing gum instead of playing with saliva · Provide break to jump on trampoline

Table 11 provides descriptions and examples of ABI strategies.

Step 4. Monitor Student Progress
Educators use progress monitoring data to evaluate whether the interfering behavior is decreasing as result of the intervention.

Computer-Aided Instruction (CAI)

Skills or intervention goals addressed
CAI can be used effectively to address academic skills, including vocabulary and grammar; communication/language skills, including functions and initiations; and recognition and prediction of emotions in others.

Overview
CAI includes the use of computers to teach academic skills and to promote communication and language development and skills. It includes computer modeling and computer tutors.

The steps for implementation of computer-aided instruction are actually guidelines for the general use of computer software for instructional purposes. Thus, the steps for the use of specific software will vary according to the instructions that accompany purchased software.

Step 1. Identify the Target of Instruction
Identify the skills or behaviors to be taught via the computer.

Step 2. Collect Baseline Data
Collect baseline data to determine current performance on the skill.

Steps 3 and 4. Identify Technology Support and Available Computers to Use
Identify and contact persons in the building who provide computer support. Also, identify available computers and information needed for use, including the type of computer, operational system, and access to the Internet.

Steps 5 and 6. Identify, Select, and Install Appropriate Software
Determine the program that may be used to provide instruction. Install and/or set up needed components and ensure proper operation.

Step 7. Learn the Software
Learn to operate software or Internet-based programs.

Step 8. Complete a Task Analysis of Steps for Using Software
Complete a task analysis of the steps for accessing and using the designated program so he or she can use the computer more independently.

Step 9. Teach the Program to Others Who Support the Student
Teach those who support the student how to use the program, including other teachers, classroom assistants, peers, and family members.

Step 10. Teach the Student Basic Computer Skills, if Necessary
Provide opportunities for students to learn basic computer skills. Skills include:

- ✶ sitting at the computer;
- ✶ wearing headphones (if necessary);
- ✶ looking at, listening to, and responding to the computer screen;
- ✶ using a mouse and/or keyboard (and possibly other equipment, such as a touch screen);
- ✶ taking turns; or
- ✶ treating the computer equipment with care.

Steps 11, 12, and 13. Introduce Student to the Program, Provide Opportunities for Use, and Offer Ongoing Support
Teach student to learn how to use the program using the task analysis and targeted instruction.

Step 14. Collect Data on Acquisition of Target Skill
Collect and analyze data on the acquisition of the target skill.

Differential Reinforcement (DR)

Skills or intervention goals addressed
DR procedures are most commonly used to reduce challenging or interfering behaviors (e.g., tantrums, aggression, self-injury, stereotypic behavior) as well as increase pro-social or desired behaviors (e.g., communication/language skills).

Overview
DR is a special application of reinforcement designed to reduce the occurrence of interfering behaviors. The rationale for DR is that by reinforcing behaviors that are more functional or incompatible with the interfering behavior, the functional behavior will increase, and interfering behavior decrease. A variety of differential reinforcement strategies can be used to increase positive behaviors and decrease interfering behaviors.

Step 1. Identify the Interfering Behavior
Define the behavior that interferes with learning and gather relevant information including topography, frequency, and intensity to provide a thorough description.

Step 2. Determine the Function of the Interfering Behavior
Conduct a Functional Behavioral Assessment and identify the function of the interfering behavior.

Step 3. Identify Data Collection Measures and Collect Baseline Data
Identify data collection measures to be used to assess the interfering behavior and collect baseline data to determine the frequency, topography, and intensity/severity.

Step 4. Select a Differential Reinforcement Procedure
Determine one or more of the following differential reinforcement procedures to use to address the function of the interfering behavior:

1. differential reinforcement of other behaviors (DRO; e.g., reinforcing singing to replace screaming);

2. differential reinforcement of alternative behaviors (DRA; e.g., reinforcing shaking hands to replace slapping);
3. differential reinforcement of incompatible behaviors (DRI; e.g., reinforcing appropriate language to replace swearing); and
4. differential reinforcement of low rates of behavior (DRL; e.g., reinforcing hand raising, which rarely happens)

Table 12 provides information that may be helpful in making decisions about which differential reinforcement procedures to use.

Table 12. Differential Reinforcement Procedures

Topography	Severity/ intensity	Frequency	Impact on environment	Procedure to consider
Unacceptable/ dangerous/ student looks extremely odd (e.g., twirling in circles in the lunch room)	Very severe/ intense (dangerous)	Constant	Severe (very distracting or disruptive)	DRI
Odd/bizarre or different	Pretty severe (potentially dangerous)	Frequent	Significant (disrupts environment but not severely)	DRI or DRL
Slightly odd but not enough to cause stigma	Somewhat severe (causes problems but is not dangerous)	Occasional	Tolerable (environment is impacted to a tolerable amount)	DRO or DRA
Within what would be expected for a similar aged student	Not at all severe (annoying or distracting)	Rare	Minimal (minor impact on environment)	DRO or DRA

Step 5. Create an Intervention Plan
Write a detailed DR intervention plan that describes the type of reinforcement, schedule of reinforcement, replacement or alternative skills, steps for implementation, and data collection procedures.

Step 6. Implement the Intervention
Implement the intervention plan that has been developed by following the schedule of reinforcement outlined and explicitly teaching the replacement or alternative skills.

Step 7. Collect Outcome Data
Regularly collect and analyze data.

Step 8. Review and Modify the Intervention Plan
Modify the intervention plan by determining the progress towards reduction of the interfering behavior and increase of replacement or alternative skills.

Discrete Trial Training (DTT)

Skills or intervention goals addressed

DTT has been shown to have positive effects on children's academic, cognitive, communication/ language, social, and behavioral skills. Some learning objectives are better taught using DTT than others. Objectives that involve fine and gross motor skills, recreation, self-care, academic, attending, imitation, and symbolic play skills are often appropriate for DTT.

Overview

DTT is a method of teaching in which the adult uses adult-directed, often massed trial instruction, reinforcers chosen for their strength, clear contingencies, and repetition to teach new skills. DTT is a particularly strong method for developing a new response to a stimulus. Its limitations involve lack of reinforcement of student spontaneity and difficulty with generalization. Thus, once a skill is learned in the DTT format, it is important to develop plans for teaching generalized use of the new skill across environments, materials, and people, and also to develop teaching plans for student initiation of the new skill.

Step 1. Decide What to Teach: Assess and Summarize Results

Determine the goals to be taught using DTT and create learning objectives that clearly state the desired antecedent, behavior, and criterion for mastery.

Step 2. Break the Skill Down into Teachable Steps

Complete a task analysis of the skill, breaking the skill into small teachable steps. Identify each step of the skill and list in sequential order from entry to mastery level.

Step 3. Set Up the Data Collection System

Select or create data sheets specifically designed for the skill being taught that will provide for collection of trial by trial data and a visual summary of the data. Include the following:

- a place for recording the outcome of the trial (e.g., correct or incorrect),
- a place for documenting prompt level,
- key for abbreviations,
- criteria for mastery,
- places to record dates when the skills are introduced and mastered, and
- graphing sheets.

Step 4. Designate Location(s)

Determine the possible locations where teaching will take place.

Step 5. Gather Materials

Assemble materials to be used during the teaching. Consider the use of the following materials when setting up a DTT program:

- Notebooks/ binders for data collection and team communication
- Preference list or menu based on preference assessment
- Variety of tangible reinforcers (edible and nonedible)
- Pictures or icons of preferred social activities (reinforcers)
- Instructional materials (letters, shapes, colors)
- Object related materials (blocks, toys, real life materials)
- Pens, pencils, markers
- Bins for storage which can be clearly labeled

Step 6. Deliver the Trials

Deliver DTT by completing the following steps:

1. Transition the student to the teaching location
2. Obtain the student's attention and, together, select reinforcers (e.g., toy, edible, action, token to be exchanged for an item or activity)
3. Provide instruction or other discriminative stimulus (antecedent)
4. Provide a prompt if appropriate
5. Wait for student response
6. Provide consequence
   a. If the student responds appropriately, deliver a reinforcer and mark the trial as correct

b. If the student does not respond, provide corrective feedback and begin the trial again with the same level of prompting
c. If the student responds incorrectly, record the trial and begin the trial again with increased prompting

Step 7. Conduct Massed Trial Teaching
Conduct teaching using massed trials, by repeating the same learning trial several times in a row, ensuring that the student is successful multiple times at whatever step of the skill is being taught. Conduct massed trials by completing the following steps:

1. Begin the teaching episode with a maintenance trial (demonstration of a skill already mastered) and record the result
2. Present instruction on the teaching target (move to this step only if the student passed the maintenance trial)
3. If the student responds correctly on the first trial, repeat the instruction several more times and record the results
4. If the student is unsuccessful, repeat the trial multiple times adding an increased level of assistance (e.g., physical rather than verbal prompt) to assure the student performs the skill
5. If the student reaches mastery criterion for the teaching target (e.g., 90 percent success for three consecutive teaching sessions), move to a more difficult level or skill (e.g., reduce level of prompting, introduce next step of the skill)
6. If the student is unable to progress, alter instruction
7. Review mastered steps or skills (maintenance trials) once or twice during each session and teach new steps or skills following the massed trials format until all steps of the skill have been mastered

Step 8. Conduct Discrimination Training
Teach the student to discriminate the teaching target from other similar items by systematically presenting the mastered item with distracters. Teach the student to generalize a concept or item by reteaching the concept with several different stimuli.

Step 9. Review and Modify
Review data and modify the program to reflect the progress or lack of progress made. If progress is not at an unacceptable level, alter instruction. If progress has occurred, add learned skills to the list of maintenance items to be reviewed and target skills for generalization by practicing skills in other settings, with other adults, and with other stimuli.

Extinction

Skills and intervention goals addressed
Extinction is used to reduce or eliminate the occurrence of an interfering behavior, especially harmful behaviors.

Overview
Extinction is a reinforcement strategy that is used with students exhibiting interfering behaviors in order to eliminate the behavior. When using extinction, reinforcement is withheld when the interfering behavior occurs in an effort to reduce or eliminate the reoccurrence of the interfering behavior. It is based on the principle that if the reinforcement for the behavior is withheld then the behavior is likely to stop as it is no longer being reinforced.

Extinction usually occurs with differential reinforcement as desired behaviors are differentially reinforced while interfering behaviors experience extinction. During the use of extinction it is likely that the interfering behavior will experience a temporary increase. This increase is known as extinction burst.

Step 1. Identify the interfering behavior
Identify the interfering behavior and its function through a Functional Behavioral Assessment.

Step 2. Identify the reinforcer
Determine what is reinforcing the behavior and effectively avoid delivering the reinforcer to the interfering behavior. Ensure everyone who interacts with the student with ASD avoids delivering the reinforcer.

Step 3. Differentially reinforce
Differentially reinforce the desired behavior by providing the reinforcer following the demonstration of a positive or replacement behavior while simultaneously not delivering any type of reinforcement to the interfering behavior.

Functional Communication Training (FCT)

Skills and intervention goals addressed
FCT is used in teaching expressive communication skills that are functionally equivalent with an interfering behavior. Functional Communication is more effective than just teaching expressive language skills in general as they serve a specific purpose for the student.

Overview
FCT relies on communication to reduce interfering behaviors and therefore involves teaching a student a socially acceptable replacement behavior that accomplishes the same outcome or function as the interfering behavior. It is important that the new replacement behavior match the function of the interfering behavior. Additionally, the variables that maintain the interfering behavior must be accessed through a functional-based assessment procedure in order to adequately reinforce the replacement behavior. FCT strategies can be used to teach both verbal (teaching a particular phrase) and nonverbal (sign language, picture exchange) methods of communication.

Step 1. Identify the Interfering Behavior
Identify an inappropriate behavior (e.g., hitting, falling to the floor) that is serving some type of communicative function and that is being reinforced (perhaps unknowingly) or a subtle communicative attempt that can be replaced with a more conventional form of communication.

Step 2. Conduct a Functional Behavioral Assessment
Conduct a Functional Behavioral Assessment to determine the function of an interfering behavior. Identify specifically the communicative intent of the problem behavior (e.g., I want to eat. I don't want to work.) Also, identify the antecedents and maintaining consequences of the behavior.

Step 3. Identify a Replacement Behavior as a Substitute for the Interfering Behavior
Determine the Functional Communication that will serve the same purpose as the interfering behavior (e.g., Teach the student to say, "I need a break.") Determine the strategy that will be used to teach the Functional Communication.

1. Select a form of communication appropriate for the student (e.g., verbal, signing, picture).
2. Select a replacement behavior that is efficient, acceptable, and recognized by all who interact with the student.
3. Determine when the Functional Communication will be taught based on the results of the Functional Behavioral Assessment.

Table 13 provides examples of student behavior and Functional Communication replacements.

Table 13. Functional Communication Replacements

Student behavior	Function of behavior	FCT strategy	Outcome
Yells and bangs head	Teacher attention	Teach to use a "I need help" card to request attention	Yelling and head banging decrease because student is receiving teacher attention when using the card.
Hits	Escape from work	Teach to say "I need a break"	Student receives break when using new phrase and returns to work when calm.

Step 4. Teach the Replacement Functional Communication by Manipulating the Environment and Using Effective Prompting Procedures

Teach the replacement behavior in the environments where the interfering behavior occurs. Steps include:

1. Manipulate materials or activities to provide opportunities for the repeated practice of the replacement behavior. Extensive opportunities to use the Functional Communication are essential. For example, the teacher might serve a small portion at snack so the student must present a picture of "cracker" multiple times or the teacher may purposefully engage in another activity so the student has to gain attention by raising her hand.
2. Prompt the student to use the replacement behavior using a prompt that ensures errorless learning.
3. Shape the production of the replacement behavior by reinforcing closer approximations until it is the desired production.
4. Remove reinforcement from the interfering behavior should it occur.
5. Provide reinforcement for the occurrence of the replacement behavior.
6. Target generalization of the Functional Communication by teaching the replacement behavior with multiple communication partners and in multiple settings.

Step 5. Design and Implement a Data Collection System

Design and then implement data collection procedures that are functional, meaningful, and useful for determining effectiveness of the FCT. Data collection focuses on:

- ✶ antecedents,
- ✶ prompts required to produce the replacement behavior,
- ✶ frequency of the replacement behaviors, and
- ✶ frequency of the interfering behavior.

Step 6. Monitor Student Progress

Data collection is monitored to ensure the student replaces the interfering behavior and is able to generalize the Functional Communication. The following questions may be helpful during this problem-solving process:

- ✶ Has the function of the behavior been identified correctly?
- ✶ Did the communicative act serve as a replacement for the behavior?
- ✶ Was the replacement behavior efficient, appropriate, and recognizable?
- ✶ Was instruction provided in environments where the interfering behavior typically occurs?
- ✶ Was the instruction provided in multiple environments and with multiple people?
- ✶ Were the prompting procedures appropriate for the student?

Naturalistic Interventions

Skills and intervention goals addressed

Naturalistic intervention can be used to facilitate communication and social skills, which may include things like expressive vocabulary, speech intelligibility, use of gesture, shared attention, and turn taking.

Overview

Naturalistic Intervention is a collection of practices including environmental arrangement, interaction techniques, and strategies based on Applied Behavior Analysis (ABA) principles. These practices are designed to encourage specific target behaviors based on students' interests by building more complex skills that are naturally reinforcing and appropriate to the interaction.

By definition, Naturalistic Intervention is used in daily routines throughout the day to develop skills. A key feature of this strategy is using materials, toys, and activities that will motivate the student to engage in the target behavior and will promote generalization of skills. Motivation is maintained by reinforcing the target behavior as well as attempts. Techniques based in ABA can be used to elicit the

target behaviors. These behavioral techniques include modeling, mand-models, time delay, and incidental teaching.

Step 1. Identify a Target Behavior
Identify a specific target behavior/skill to be the focus of the intervention. This target behavior may focus on prelinguistic or linguistic communication and/or social skills. Examples of specific skills are:

- ✶ Connor will use the pronouns he, she, and it correctly.
- ✶ Jay will respond to a question asked by a peer.

Step 2. Collect Baseline Data
Determine the student's current use of the target skill through data collection.

Step 3. Identify Contexts and Instructional Format for Intervention
Identify where and how Naturalistic Intervention will be implemented. Consider the following:

1. Identify the contexts in which to embed Naturalistic Intervention. Naturalistic Intervention should take place throughout the day in the context of daily routines / schedules.
2. Plan to implement three instructional strategies within daily routines / schedules to teach desired skills using Naturalistic Interventions:
    a. Student-directed activities. In these activities, students select what they want to do within a specific environment and the teacher follows the student's lead to provide instruction.
    b. Routine activities. Embed instruction in routine activities that take place on a regular basis.
    c. Planned activities. Planned activities are set-up in advance to provide structured opportunities for students to practice the target behavior.

Step 4. Arrange the Environment to Elicit the Behavior
Use information from Step 3 and materials / resources within learning environments to capture students' attention and teach the target behavior. Do this by:

1. Choose motivating materials/activities to engage students and promote the use of targeted skills.
2. Manage and distribute teaching materials in a way that encourages students to learn the target skill. The teacher should be "the keeper of the goods" and distribute the materials in a manner that elicits student performance. For example, communication can often be elicited by "forgetting" to provide a pencil, putting a doll's hat on her feet as if by accident, or having two children share markers during an art activity. Such organization is likely to elicit a request or comment from the student.
3. Arrange the intervention context and environment to encourage the use of the target behavior/skill and maintain the student's interest.

Some examples follow:

- ✶ LaTisha's team has identified her target behavior to be pointing to request. Her teacher knows she loves to complete puzzles. She takes LaTisha's puzzles off the table, and puts them on a bookshelf that LaTisha cannot reach. The intention is for LaTisha to point to the puzzles to request them.

- ✶ Ruby's team has identified her target behavior to be increased turn taking. She enjoys manipulatives. Her teacher replaces the standard manipulatives (e.g., counting bears) with turn taking games that involve the manipulation of small parts, like Ants in the Pants™, Stacrobats™, and Kerplunk™. The intention is for Ruby to be enticed by the small pieces and then engage in turn taking while playing the game.

Step 5. Elicit the Target Behavior

Elicit the target behavior using interaction techniques and, if necessary, behavioral strategies like prompting and modeling. Steps include:

1. Engage the student in a language-rich and student-centered interaction in which the teacher is highly attuned and responsive to the communicative attempts of the student. Use the following techniques:
    a. Follow the student's lead. Following the student's lead involves allowing him or her to direct the interaction and the activity. Rather than a teacher having a set lesson plan (e.g., to play in the toy house), the teacher waits and sees what the student wants to do. For example, if the student goes to the toy house, engagement occurs there. But if the student goes to the block area, engagement occurs in the blocks. Remember the environment has already been arranged to elicit specific targets (Step 4), so either activity should lead to the desired behavior. Another example is to provide a student with several items known to be motivating, such as dinosaurs, trains, and markers. Allow the student to choose the desired item then provide engagement with the item chosen. Again, each item should lead to the desired behavior.
    b. Be at the student's level. The teacher is positioned to share face-to-face interactions in order to facilitate shared attention.
    c. Respond to the student's verbal and nonverbal initiations. Be vigilant and observe the student watching for any communicative attempts. Be aware of even the most subtle communicative attempts and respond to these attempts.
    d. Provide meaningful verbal feedback. Respond to the student's communicative attempts with words. This provides a model and helps the student know that attention is being shared. For example, a student may be trying to open a juice box and say, "Aah!" The teacher can respond, "Open!"
    e. Expand the student's utterances. When a student is verbal, especially at the one- to three-word phrase level, the teacher can build on what the student says, thereby demonstrating more linguistically sophisticated options.
2. Use strategies based on ABA to elicit the target behavior within intervention contexts and arranged environments. Select one of the following interventions:
    a. Modeling,
    b. Mand-modeling,
    c. Modified time delay, or
    d. Incidental teaching.

Modeling: Modeling involves demonstration of the desired behavior. Implement modeling by:

a. Establishing shared attention,
b. Presenting a verbal or physical model,
c. Repeating the response and providing the requested material if the student responds correctly,
d. Providing another model if the student does not respond or responds inaccurately,
e. Continuing these steps until student demonstrates mastery with the target behavior,
f. Fading the use of the model, and
g. Expanding the model provided and the response desired from the student.

Mand-modeling: Mand-modeling incorporates questions, choice, direction into the activity prior to initiating a modeling procedure. Implement mand-modeling by:

a. Establishing shared attention,
b. Presenting a verbal direction (mand) or question,
c. Repeating the response and providing the requested material if the student responds correctly,

d. Providing another model if the student does not respond or responds inaccurately,
e. Modeling the appropriate behavior and providing the material/activity if the student attempts to respond but does not meet the target level,
f. Continuing these steps until the student demonstrates mastery with the target behavior, and
g. Expanding the verbal direction and questions provided and the response desired from the student.

Table 14 illustrates how mand-modeling can be used to teach the use of two-word utterances.

Table 14. Mand-modeling Procedure Example

Steps	Example
Establish shared attention	*Sasha and her teacher are having snack at the table where enticing snacks are located.*
Provide a verbal direction (mand) or question	*Teacher says, "Tell me what you want, Sasha" or gives a choice question, "Do you want apples or crackers?"*
Student responds correctly	*When Sasha says the target response ("Want crackers"), her teacher provides the crackers and repeats her utterance by saying, "Want crackers!"*
Student does not respond or does not respond accurately	*When Sasha points to the crackers instead of verbalizing, her teacher prompts her by saying, "Say, 'Want crackers'."*
Student gives the target response	*When Sasha repeats, "Want crackers," her teacher provides the crackers and repeats her utterance by saying, "Want crackers!"*

Modified Time Delay: Modified time delay, or waiting for a pre-determined amount of time, before providing a prompt allows students to initiate the behavior and encourages them to become aware of nonverbal cues. Implement modified time delay by:

a. Establishing shared attention and create an opportunity for the student to respond (e.g., hold the juice, shake the marker box),
b. Waiting three to five seconds for the student to demonstrate the target behavior,
c. Repeating the response and providing the requested material if the student responds correctly,
d. Providing another model if the student does not respond or responds inaccurately,
e. Modeling the appropriate behavior and providing the material/activity, if the student attempts to respond but does not meet the target level,
f. Continuing these steps until the student demonstrates mastery with the target behavior, and
g. Expanding the response desired from the student.

The following table illustrates how modified time delay can be used to teach a student with ASD how to use two-word utterances to request.

Incidental Teaching: Incidental teaching uses questions, directions, modified time delay, and modeling to encourage elaboration of a student's behavior or response. Implement incidental teaching by:

a. Setting up the environment, establish shared attention, and create an opportunity for the student to respond,
b. Waiting for student to initiate the behavior,
c. Responding with a request for the behavior, if the student does not initiate the target response,
d. Prompting for elaboration until the student responds appropriately if the student does

Table 15. Modified Time Delay Technique Example

Steps	Example
Establish shared attention	*John's teacher is pushing him on the swing, facing him.*
Wait for student to make a request	*The teacher lets the swing come to a stop. She waits, with her hands up as if to push, and has an expectant look on her face.*
Student demonstrates behavior at the target level	*John says, "Push me!" the teacher says, "Push me really high!" and pushes the swing.*
Student does not initiate at the target level	*John grunts instead of verbalizing. The teacher gives a mand, "Tell me what to do." or gives a model, "Say 'Push me'."*
After the mand or model is provided, student responds correctly	*John says, "Push me!" the teacher says, "Push me really high!" and pushes the swing.*
Student does not give the target response but makes an attempt	*John says, "Puh," the teacher says, "Push me!" and pushes him on the swing.*

not initiate the target behavior, and

e. Using model, mand-model, or modified time delay procedures depending on the needs of the student if the student does not demonstrate the expansion.

Step 6. Use Data Collection to Monitor Student Progress and Determine Next Steps

Review data and modify the program to reflect the progress or lack of progress made. If progress is not at an unacceptable level, alter instruction. If progress has occurred, add learned skills to the list of maintenance items to be reviewed and target skills for generalization by practicing skills in other settings, with other adults, and with other stimuli.

Peer Mediated Instruction

Skills and intervention goals addressed

PMI is frequently used to address social behaviors and communication skills including eye contact, play activities initiating conversation, offering or requesting help, maintenance of conversation, expanding content of conversations, and demonstrating affection.

Overview

PMI is a strategy that is used to teach typically developing peers ways to interact with students with ASD in both naturalistic and structured settings. Peers assist students with ASD in learning new social skills by increasing social opportunities in learning environments. Peers are systematically instructed in ways of engaging with students in both teacher directed and student directed activities. PMI can be used across all age ranges and developmental levels. Peer mediated strategies include:

- Peer tutoring
- Peer modeling
- Classwide peer tutoring
- Cooperative groups
- Incidental teaching
- Peer assisted learning strategies
- Peer initiation training

Step 1. Select Peers

Select peers who will provide social support to the student with ASD. Select peers who demonstrate good social skills, language, and are typically well liked by others. They also should share a common schedule or academic grouping as the student with ASD and demonstrate a willingness to participate.

Step 2. Train Peers

Train peers to support the student with ASD. Content for peer training varies according to the age of the student. For elementary students:

1. Teach specific behaviors used to facilitate social interactions which include:
   - ✧ Initiating interactions
   - ✧ Responding to initiations
   - ✧ Maintaining interactions
   - ✧ Greetings/topics
   - ✧ Giving/receiving compliments
   - ✧ Turn taking/sharing
   - ✧ Helping and asking for help
   - ✧ Including others in activities
2. Teach to learn to recognize and appreciate individual differences
3. Provide basic strategies that can be used to interact and support the student with ASD in social contexts, including:
   - ✧ Providing frequent and positive feedback to the student
   - ✧ Modeling relevant communication skills
   - ✧ Facilitating interactions with other peers

Step 3. Support Peers

Provide ongoing support and feedback to the peer throughout the process. The follow-up support, like training, is dependent on the age of the students. For elementary students, following the initial training, hold sessions to demonstrate and model for the peers specific strategies (see #2 above) that can be used to support the student with ASD during social interactions. As peers become more comfortable and proficient in providing support to the student with ASD, decrease the level of involvement allowing the peer to assume the primary role of social support.

Step 4. Implement in Classroom Setting and Throughout the Day

Implement PMI throughout activities across the school day. Consider environmental factors when developing peer mediated interactions to optimize learning. The table below outlines considerations for implementing PMI.

Table 16. Considerations for Peer Mediation

Factor	What it looks like
Supportive social environment	The environment fosters social interaction through small social groups and by seating trained peers next to student with ASD during whole-class activities
Learning opportunities	Small academic groups, class centers, special areas such as library and PE, and structured games provide interaction opportunities
Monitored social interactions	Feedback is provided to peers on an ongoing basis at the end of each activity, class period, or during weekly meetings

Step 5. Extend Across the Day

Extend peer networks across settings and people so that the student with ASD begins to generalize the skills they have practiced and learned. Provide extension of activities in natural social settings with a minimum of two to three different routines each day. Maintain peer groups during generalization to promote interpersonal connections and friendships.

Picture Exchange Communication System (PECS)

Skills and intervention goals addressed

The Picture Exchange Communication System (PECS; Frost & Bondy, 2002) is used to teach communication, social, and behavior skills.

Overview
PECS was developed for students with ASD and other sociocommunicative disorders with the aim of teaching communication within a social context. PECS is used in a variety of environments including the home, school, and community. The strategy consists of six distinct phases. These phases are composed of a variety of Applied Behavior Analysis (ABA) teaching strategies including backward chaining, incidental teaching, shaping, discrete trials, delayed prompting, and discrimination training.

Step 1: Conduct a Reinforcer Assessment
Conduct a reinforcer assessment to determine items that are highly preferred, preferred, and nonpreferred by the student.

Step 2: Initiate the Phases and Steps of the PECS
Initiate the phases of the PECS systematically, moving from one step to another as each is mastered. Below is the list of the phases. Each phase requires implementation of specific steps.

Phase 1: Teaching the Physically Assisted Exchange
The focus of Phase 1 is on teaching students with ASD how to look at, reach for, pick up, and hand the picture/symbol to a communication partner.

Phase 2: Expanding Spontaneity
The outcome of Phase 2 is to increase the student's generalization and spontaneity of the picture exchange.

Phase 3: Simultaneous Discrimination of Pictures
In Phase 3, the student must discriminate and choose from one or more pictures/symbols during communicative exchanges.

Phase 3A: Discrimination between a Highly Preferred Icon and a Distracter Icon Two pictures (one preferred and one nonpreferred) are provided at some distance so the student moves to and chooses the correct picture/symbol from the two pictures.

Phase 3B: Teaching Simultaneous Discrimination of Pictures
Pictures are added to increase the number of discriminations the student must make. Error correction procedures are used to teach picture discrimination.

Phase 4: Building Sentence Structure
It is time to move to Phase 4 when the student is able to use 12 to 20 pictures and is able to discriminate among them to select the desired item. In this phase, the student is taught to use the "I want" symbol with one of the mastered pictures/symbols on a sentence strip during a communicative exchange.

Phase 5: Responding to "What do you want?"
Phase 5 instruction is focused on encouraging initiations and teaching the student to answer the question, "What do you want?"

Phase 6: Commenting in Response to a Question
The purpose of Phase 6 is to teach labeling and naming objects.

Phase 6A: Commenting in Response to a Question
The student responds to "What do you see?"

Phase 6B: Commenting in Response to a Question – Differentiating Responses to Questions
An "I see" symbol is placed below the "I want" symbol in corner of the communication book. The student learns to discriminate between the two questions.

Phase 6C: Commenting in Response to a Question – Promoting Spontaneous Commenting and Building in Attributes and Modifications
As the student demonstrates the ability to make requests and answer questions, questioning is eliminated to promote spontaneous commenting.

Step 3: Expand Use of the PECS
Using the PECS principles students are taught a variety of language concepts and how to use communication spontaneously in different environments.

The table below provides a description of the PECS.

Table 17. The Picture Communication System

Phase	Supplies	Proximity	Goal
Phase I: Teaching the Physically Assisted Exchange	· Two people (one to receive the communication and one to assist the student) · Communication Board · Reinforcers	Close	Have the child spontaneously pick up picture, reach toward teacher and place picture into the teacher's open hand
Phase II: Expanding Spontaneity	· Communication Board · Reinforcers	Distance is increased between child and communication board and child and teacher.	Expand spontaneity through increasing communicative persistence (child goes to board, finds the teacher, and releases the picture)
Phase III: Simultaneous Discrimination of Pictures	· Communication Board · Reinforcer	Any distance	Discriminate between pictures (selects correct picture from an array)
Phase IV: Building Sentence Structure	· Communication Board · Sentence Strip · Reinforcers	Any distance	Make a request using the carrier phrase "I want." (selects picture and places it on sentence strip with picture depicting "I want")
Phase V: Responding to "What do you want?"	· Communication Board · Sentence Strip · Reinforcers	Any distance	Respond to phrase "what do you want?" using delayed prompting (spontaneously requests and responds to "What do you want?")
Phase VI: Commenting in Response to Questions	· Communication Board · Sentence Strips · Reinforcers	Any distance	Comment, label, and name objects and respond to different questions (spontaneously answers questions and comments)

Pivotal Response Training (PRT)

Skills and intervention goals addressed

PRT focuses on pivotal behaviors of motivation, responding to multiple cues, self-management, and self-initiations. Through the learning and development of these pivotal skills improvements occur in a variety of academic, social, communication, and self-management areas.

Overview

PRT is a systematic method of applying scientific principles of applied behavior analysis to teach students with ASD. PRT is naturalistic intervention that builds on student initiatives and interests. PRT targets a small set of pivotal behaviors that lead to the development of skills in other important areas. Pivotal behaviors for students with ASD include motivation, responding to multiple cues, self-management, and increased incidence of self-initiation through peer mediation. These behaviors are pivotal in that they are the foundational skills upon which widespread and generalized improvements can be made in many other domains. Strategies to address the two pivotal behaviors of motivation and responding to multiple cues are provided below. Self-management and increased incidence of self-initiation through peer mediation are described in other sections of this document.

Pivotal Behavior: Motivation

Step 1. Establish Student Attention

Obtain student attention prior to providing a learning opportunity. Once student attention is obtained proceed with brief and clear instructions.

- ✶ Tap student on shoulder
- ✶ Make eye contact
- ✶ Say student's name

Step 2. Use Shared Control and Turn Taking

To increase the student's motivation to interact with the learning materials, use shared control by allowing the student to determine which parts of the routine they will complete and which parts the teacher will complete. As students become more proficient with the skills, shift more responsibility for completing the task to the student.

Step 3. Use Student Choice

Allow the student to choose the materials or toys they want to work or play with. In order for this to be effective the teacher must complete a series of tasks:

1. Observe the student engaging in the environment when they have free access to materials to identify preferences.
2. Arrange the environment with student-preferred, age-appropriate objects and activities.
3. Allow the student to select materials, topics, or toys during the teaching activity.
4. Follow the student's lead during interactions and learning opportunities.
5. Incorporate choice making into naturally occurring routines and activities.

Step 4. Vary Tasks and Responses

Vary tasks throughout learning opportunities to maximize student motivation and engagement. Additionally, vary instructions and environmental conditions to foster continued learning and responding to a range of stimuli. Students will typically indicate when a change is necessary. For example, a student who is bored may repeatedly sign or say, "All done" or vocally protest. In this case, intersperse newer tasks with familiar ones to increase interest.

Step 5. Intersperse Acquisition and Maintenance Tasks

Combine and intersperse new tasks with old tasks that have been mastered to maintain motivation and engagement. This interspersing of tasks provides a sense of success in using a variety of skills.

Step 6. Reinforce Response Attempts

Reinforce attempts at responding. By providing a consequence-based strategy that allows for all attempts and approximations of the target response to be reinforced through positive reinforcement, the probability that the student will try the task in future opportunities is increased. For example, if Sid reaches for a ball and says "Buh" (the target is "ball"), Sid is reinforced for the approximation while the teacher says "ball" and hands him the ball.

Step 7. Use Natural and Direct Reinforcers
Use natural occurring items and activities as reinforcement. Identify materials and activities that can be used during the teaching session that have a direct relationship to the goal or desired outcome. For example, a student who likes cars is given a closed plastic bag with a car inside. Once the student asks or approximates "help" the bag is opened and the student is allowed to play with the car for a brief period. The car in this case is the natural reinforcer.

Pivotal Behavior: Responding to Multiple Cues

Step 1. Vary Stimuli and Increase Cues
Incrementally teach a student to respond to multiple cues until he or she responds to a more complex task. Do this by:

1. Identify a variety of cues (properties or attributes) that are associated with the target skill and can be used during a teaching activity. For example, select cues such as colors, size, or shape to teach a receptive language task.
2. Target at least two cues (e.g., overemphasizing feature of object, color, size) so the student learns to use the target skill in response to more than one cue. For example, the student can identify the big, red car not just the red car.
3. Gradually increase the number of cues associated with an object, material, or toy so that the student can respond to a variety of stimuli. For example, the student obtains the big red car that is outside the toy garage. As the student responds appropriately, make the tasks more complex and involve more cues.

Step 2. Schedule the Reinforcement
Use different schedules of reinforcement to teach the student to respond to multiple cues. Identify numerous reinforcers and provide reinforcement for every attempt to use the target skill successfully.

Prompting

Skills and intervention goals addressed
Prompts are visual, gestural, or physical stimuli used to increase the likelihood that a behavioral response is learned. Prompting can be used to teach virtually any skill.

Overview
Prompting includes any help given to students that assist them in using a specific skill. Prompting is used to teach new skills and in the generalization of skills after they are learned. There are different types of prompts that can be applied in a systematic fashion to help students with ASD acquire target skills. A prompting procedure will be used to methodically apply and fade the prompts when teaching a skill.

Step 1: Identify the Target Skill or Behavior
Define the target behavior or skill that the student with ASD is to acquire.

Step 2: Identify the Target Stimulus
The target stimulus is the event or thing that cues the student to engage in the target behavior. It may also be known as the instruction or antecedent. Clearly specifying the target stimulus allows the teacher to ensure students are attending and responding to the environment, and helps the teacher refrain from delivering too many prompts. Target stimuli include:

- Naturally occurring event. Examples: Having dirty hands after finger painting is the target stimulus for hand washing; needing to use the bathroom is the target stimulus for asking to use the restroom or moving to the bathroom and using it.

- Completion of an event or activity. Examples: Completing an instructional activity is the target stimulus for putting materials away, cleaning up the area, and moving to the area for the next activity; returning from lunch is the target stimulus for sitting at the desk and beginning mathematics.

- An external signal. Examples: A ringing bell may signal it is time to go to the next class; the teacher telling the whole class it is time for snack is the target stimulus for putting away work and retrieving the snack.

Step 3: Select the Type of Prompting Procedure to Use

Select the type of prompting procedure based on the student's learning profile and the skill to be taught. The following questions may be helpful when attempting to determine the type of procedure:

- Which types of prompts have been used to teach a student new skills?
- Has the student been taught how to use this type of skill before?
- What types of prompts have been most successful when teaching the student a variety of skills?
- How quickly is the student likely to learn the target skill?
- Is the student likely to become prompt dependent?

The figure below depicts different types of prompting procedures and provides a brief definition of each.

Figure 5. Prompting Procedures

Most to Least:
Moving from more intrusive to less intrusive prompts contingent on student needs for less support

Least to most
Moving from less intrusive to more intrusive prompts contingent on student need for more support

Graduated Guidance
Providing a controlling prompt that ensures correct response, then moving from more to less physical support

Time Delay
Inserting wait time between the target stimulus and the prompt and gradually increasing the amount of time until student performs independently

Step 4: Select the Type(s) of Prompts to Use

Select the types of prompts that will be used to teach a skill. Any number or combination of prompts may be used. Be aware of how intrusive prompts may be and select the appropriate prompt or prompts based once again on the student's learning profile as well as the skill to be taught. Table 18 shows the prompt hierarchy from the least intrusive to the most intrusive. Keep in mind, verbal prompting is often the easiest and most convenient to use but is often not the most appropriate as it can lead to prompt dependency.

Step 5: Select the Number of Levels in the Prompting Hierarchy

Select the number of prompt levels to be used in the prompt hierarchy. With the least-to-most, most-to-least, as well as time delay prompting procedures, the hierarchy often has at least three levels, but it may have more. One level is always the independent level (no prompts are used) and one level is the controlling prompt (one that ensures the student with ASD responds correctly). The other prompt levels, called intermediate levels, provide more help than the independent level and less help than the controlling prompt.

Step 6: Implement the Intervention Utilizing the Predetermined Prompts and Prompting Procedure

Using the prompting procedure outlined, implement the intervention to teach the desired behavior or skill. Use data to determine when to move to a more or less intrusive prompt.

Step 7: Monitor Student Performance

Track student responses and type and number of prompts required to perform the targeted behavior or skill. The prompting required provides valuable information about the student's performance and progress. Review data and modify the program to reflect the progress or lack of progress made. If progress is not at an unacceptable level, consider altering prompting used. If progress has occurred, target skills for generalization.

Table 18. Prompt Hierarchy

Prompt	Definition	Example
Visual	Pictures, objects, or symbols that provide students with information about how to use the target skill or behavior	Transition card used to show the student where to go after reading group
Gestural	Movements that cue students to use a particular behavior or skill	The teacher gestures (points) to what is to be done
Model	Performance or demonstration of the target skill or behavior. Full model prompts can be verbal if the skill being taught is verbal, or they can be motor responses if the skill being taught involves moving a body part.	The teacher demonstrates taking a turn in a game
Partial Physical	Light touch or physical guidance given to students to help them use the target behavior or skill	The teacher moves the students hand gently to help him make the first part of the letter "w" and has him finish making the letter
Full Physical	Full physical support or guidance to complete the entire target behavior or skill	The teacher provides full physical assistance to help the student brush his teeth
Verbal	Statements that provide a verbal cue to complete the target behavior or skill	The teacher says, "Get your coat." after he has reminded the student it is time for recess

Reinforcement

Skills and intervention goals addressed

Reinforcement is used to teach new skills, increase the rate by which the student learns, and teach challenging or difficult skills. Reinforcement can be used to teach any skill or behavior.

Overview

Reinforcement is defined as a situation or event that follows a particular behavior resulting in an increase in the likelihood that the behavior will happen again in the future. Ultimately, reinforcement is the key to increasing appropriate behaviors. Reinforcement is a fundamental practice that is almost always used with other evidence-based practices such as prompting, time delay, functional communication training, and differential reinforcement of other behaviors. Reinforcement is most effective when it is individualized for a particular student and when it is presented in response to a student's use of a target skill/behavior. The goal of this practice is to increase skills while gradually fading reinforcement strategies to promote maintenance and generalization.

The three categories of reinforcement include positive reinforcement (something that is desired is delivered following a behavior), negative reinforcement (something that is aversive is removed following a behavior), and automatic reinforcement (the behavior results in some type of physiological sensation that is either positively or negatively reinforcing).

There is not a universal reinforcer therefore it is necessary to conduct reinforcer assessments to determine what is reinforcing for each individual student. Often, it is required to think creatively and out of the box for reinforcers for students with ASD. It is often helpful to consider the individuals preoccupations, desired objects, and sensory needs when creating a menu of reinforcers.

Step 1. Identify and Gather Potential Reinforcers
Identify and gather a diverse selection of items and activities that the student prefers. The following activities can be used to identify reinforcers:

- ✶ Identify potential reinforcers by asking the student what he/she would like to work for (if appropriate)
- ✶ Identify potential reinforcers by observing the student in natural settings and identifying activities, objects, and foods that the student selects when allowed free choice
- ✶ Identify potential reinforcers by interviewing parents or other staff
- ✶ Identify potential reinforcers by conducting a reinforcer assessment

Step 2: Identify the Target Skill or Behavior
Define the target behavior or skill that the student with ASD is to acquire. Define exactly what the student needs to do in order to receive reinforcement.

Step 3: Identify the Type of Reinforcement Strategy to Use
Identify the type of reinforcement strategy to use to teach the target behavior or skill. There are three primary possibilities:

- ✶ Positive reinforcement refers to the addition of something positive such as receiving a cookie, time on the computer, or a high five. Positive reinforcement is generally the strategy used first when trying to teach new skills.

- ✶ A token economy program is a type of positive reinforcement strategy that is referred to as such because they are based upon a monetary system in which tokens are used to acquire a desired reinforcer. For example, a student receives tokens when he uses a target skill/behavior appropriately. When he acquires a certain number of tokens, they can be exchanged for objects or activities that are reinforcing.

- ✶ Negative reinforcement, on the other hand, refers to the removal of an object or activity the student with ASD finds aversive such as washing tables, doing work, or staying seated. When the student uses the target skill/behavior (e.g., requesting a break, raising hand, taking a bite of food), the aversive object or activity is removed. The goal of negative reinforcement is to remove the aversive stimulus so that the student's use of the target skill/behavior will increase.

Step 4. Select the Type of Reinforcement to Use
Select the type of reinforcement to use. Consider the age of the student and the target skill or behavior. Also, consider potential natural reinforcers, or the typical results of a behavior in the natural environment, that can be used to teach the skill. Below are three general categories of reinforcers:

- ✶ Primary reinforcers satisfy a physical need by making the individual feel good (e.g., food, liquids, sleep).

- ✶ Secondary reinforcers are objects or activities that individuals have grown to like, but do not need biologically (e.g., computer, toy, ball).

- ✶ Social reinforcers are motivational items, words/phrases, or actions that individuals have grown to like due to the social meaning (e.g., smile, Good Job!, tickle). Social reinforcers often must be taught to those with ASD because they may not be inherently reinforcing.

Step 5. Select the Schedule of Reinforcement
Select a schedule of reinforcement based on the skill to be taught. Schedules of reinforcement refer to the frequency or timing of the delivery of reinforcement following a target skill/behavior. For example, a reinforcer can be delivered either on a continuous or on an intermittent schedule. Typically, the newer or more difficult a skill, the more reinforcement required to teach it. The following table outlines the different schedules of reinforcement.

Table 19. Schedules of Reinforcement

Type of Reinforcement	Function	Definition	Example
Continuous	Produces a high steady rate of responding	Behavior is reinforced after every correct response	Student is reinforced every time he matches pictures correctly
Fixed ratio	Produces a high steady rate of responding	Behavior is reinforced after a set number of responses	Student answers three questions correctly and is reinforced with a bite of cracker
Variable ratio	Produces a high steady rate of responding	Behavior is reinforced after an unpredicted number of responses	Student answers two questions and is reinforced then is not reinforced again until after five more questions
Fixed Interval	Consistent amounts of responding for a designated interval	Behavior is rewarded only after a certain amount of time has passed	Student is reinforced after five minutes of working appropriately
Variable Interval	Produces a slow steady rate of responding	Behavior is rewarded after an unpredictable amount of time has passed	Student is rewarded at two minutes then at seven minutes following on task behavior

Step 6. Organize Reinforcers and Determine Presentation

Organize a system for presenting reinforcer options to the student with ASD so the student may make choices regarding the reinforcer received. It may be beneficial to present the options visually either through text or pictures. For example, a reinforcer menu may be useful, allowing the student to choose the desired item. When providing choices to the student, the following considerations may be beneficial:

- ✶ Display two to three reinforce options at a time
- ✶ Lay them out so they are equally easy to get
- ✶ Let the student take whatever they choose in any order they choose
- ✶ Provide noncontingently so the student does not have to ask or say please to get the item

Step 7. Deliver the Reinforcer

Deliver the reinforcer contingent upon the desired behavior or skill. This is critical for the effective use of reinforcement and for learning to occur.

Step 8. Monitor Student Progress and Move Towards Natural Reinforcement

Track student progress and review data and modify the program to reflect the progress or lack of progress made. If progress is not at an unacceptable level, consider altering the reinforcement used. If progress has occurred, fade the level and type of reinforcement until the student is able to perform the skill using natural reinforcement.

Response Interruption and Redirection (RIR)

Skills or intervention goals addressed

RIR is used to decrease interfering behaviors, predominantly those that are repetitive, stereotypical, and self-injurious in nature. RIR is

particularly useful with persistent interfering behaviors that occur in the absence of other people, in a number of different settings, and during a variety of tasks. These behaviors often are not maintained by attention or escape. Rather, they are more likely to be maintained by sensory reinforcement and are often resistant to intervention attempts.

Overview

RIR contains two main components: (1) response interruption and (2) redirection. During the response interruption component of the intervention, teachers/practitioners stop the student from engaging in the interfering behavior. This is usually accomplished by physically and/or verbally blocking a student's attempts to engage in a stereotypical or repetitive behavior (e.g., teacher puts her hand at a short distance from the student's mouth when he tries to engage in hand mouthing). Redirection, the second component of the intervention, focuses on prompting the student to engage in a more appropriate, alternative behavior.

Step 1. Conduct a Functional Behavioral Assessment

Conduct a Functional Behavioral Assessment to determine the function of an interfering behavior as well as the antecedents and maintaining consequences of the behavior.

Step 2. Identify a Replacement Behavior as a Substitute for the Interfering Behavior

Identify a more appropriate, alternative behavior to take the place of the interfering behavior. When identifying an alternative behavior, especially those that are maintained by sensory reinforcement, it is important to identify a behavior that provides the same sensory reinforcement to the student with ASD, but in a more appropriate way. For example, an alternative behavior for a student who engages in motor stereotypy may be holding a desired object (squishy ball) or putting hands together. A replacement behavior for a student who engages in verbal stereotypy may be saying "hello."

Step 3. Implement RIR

Implement the response interruption and redirection components of the intervention by following these steps:

1. When a student exhibits an interfering behavior interrupt the attempts by using:

   - **Physical blocking** - Physically prevent the student from engaging in a motor stereotypy. Use the least amount of physical assistance necessary to stop the student from engaging in the interfering behavior. EXAMPLE: A teacher places her hand about an inch from a student's mouth when he attempts to put his hand in his mouth.

   - **Verbal blocking** - Prevent the student from engaging in the interfering behavior by issuing a verbal directive. EXAMPLE: A teacher says "No, don't" when a student attempts to put her hand in her mouth or asks the student a known question, such as, "What color is your shirt?"

2. Next, redirect the student to the alternative behavior by:
   - saying his or her name in a neutral tone of voice,
   - establishing eye contact, and
   - using the system of least-to-most prompts to help the student engage in the alternative behavior.

3. Praise and reinforce the use of the alternative skill.

Step 4. Monitor Student Progress

Data is collected and monitored to ensure the student replaces the interfering behavior and is able to use the alternative behavior.

Self-management

Skills or intervention goals addressed

Self-management interventions can be used to reduce inappropriate and interfering behaviors and to increase social, adaptive, and communication skills. Specific examples of skills that can be targeted by self-management interventions are giving compliments, responding to others, sharing, increasing on-task behavior, initiating interactions, reducing interfering behaviors, promoting daily living skills, increasing play skills, and conversing.

Overview

Self-management interventions help students with ASD learn to independently regulate their own behaviors and act appropriately in a variety of settings. Students learn to discriminate between appropriate and inappropriate behaviors, monitor their own behaviors with accuracy, and reinforce themselves for behaving appropriately.

Step 1. Prepare the Self-management System

Prepare a self-management system by completing the following steps:

1. Identify and operationally define the target behavior in observable and measureable terms. This is necessary so the occurrence and nonoccurrence of the target behavior can be identified.
2. Identify reinforcers that are rewarding for the student.
3. Develop a data collection system. Generally the type of data collection system will be based on an interval or frequency system. In an interval system, the student will record whether the target behavior occurred during a designated interval of time. With a frequency system, the student will indicate how many times the behavior occurred.
4. Identify the initial criterion for the target behavior. The initial criterion is based on the occurrence or nonoccurrence of the behavior prior to the implementation of the intervention and should be set low enough for the student to successfully use the target skill.
5. Select the self-monitoring recording and cueing device. The strategies chosen should reflect the needs of the student and fit within the context it will be used without being intrusive.

Examples of devices used to cue the student to assess his or her behavior include:

- ✶ Alarm clocks
- ✶ Stopwatches
- ✶ Wristwatches
- ✶ Visual timers
- ✶ Teacher tapping student's desk
- ✶ Natural transition periods
- ✶ Termination of an activity (e.g., reading)

Examples of devices for the student to record the occurrence or nonoccurrence of the behavior include:

- ✶ Pencil and paper
- ✶ Clicker
- ✶ Token board
- ✶ Moving paper clips from one pocket to the other
- ✶ Moving rubber bands from one wrist to the other

Step 2. Teach Students to Use the Self-management System

Teach the student to implement a self-management system. Students should be able to demonstrate elements of the self-management system before actually implementing it.

1. Students should demonstrate the target behaviors (or not demonstrate if the behaviors are targeted for reduction). Students must be able to demonstrate the appropriate behaviors consistently and independently prior to implementation. They should also be able to demonstrate correct behavior upon request.
2. Students should discriminate whether the target behaviors have or have not occurred through self-monitoring. This can occur by modeling examples and nonexamples of

the behavior and actively teaching correct identification through prompting and reinforcement.

3. Students should be able to accurately record when they have and have not demonstrated the target behaviors. This can be done through modeling the use of the recording device and active teaching through prompting and reinforcement.
4. Students need to manage the reinforcers. Students learn to identify when a reinforcement should be delivered, obtain and consume the reinforcement, and return to the appropriate task upon completion.

Step 3. Implement the Self-management System

Once the student is fluid at the above outlined skills, implement the self-management system. This is accomplished when the student independently (without adult prompting) records behaviors at the appropriate time with at least 80 percent accuracy. During the implementation of the self-management system the student is taught to obtain materials needed to use the system independently. The student is taught to use the system in the context of the natural routine. Prompting is faded as soon as the student consistently and independently acquires the target throughout the process. Step 3 is similar to Step 2 except now the student is performing all the skills together in the targeted setting.

Step 4. Promote Independence with the Self-management System

Provide steps to ensure the student is able to use the system independently across settings. Ongoing and intermittent checks are used to determine if the student continually used the self-management system accurately. Initially the checks are frequent but fade as the student becomes more accustomed to the system. As the student demonstrates accuracy with the system the criterion, session length, and interval length are gradually increased.

Social Narratives

Skills or intervention goals addressed

Social narratives are typically used to address behavioral difficulties, teach social skills, and promote effective and appropriate communication.

Overview

Social narratives are interventions that describe a social situation in detail highlighting cues and offering examples of appropriate responding. They are written to facilitate understanding of social situations and events and the perspectives of others. They combine the use of written word to enhance understanding. The social narrative breaks the steps and behaviors of the interaction down into smaller understandable components for skill acquisition. They may come in many forms (e.g., paper, sentence strips, computer) and must be suitable to the student based on individual needs. Social narratives are written using six types of sentences (descriptive, directive, perspective, affirmative, cooperative, and control) that answer specific questions (who, what, when, where, and why).

Step 1. Identify the Social Situation for the Intervention

Select a social behavior for change based on the student IEP and current needs. The targeted behavior should result in positive social interactions, a safer environment, additional social learning opportunities, or a combination of all three.

Step 2. Define the Target Behavior or Skill

Define the target behavior in measureable and observable terms to increase the ease by which the skill is taught and data is collected on the skill. Clearly defining the target behaviors will also increase the student's ability to understand and learn the expected skill.

Example

- ✶ Vague: Tamar will interact appropriately.
- ✶ Correct: Tamar will greet others by saying hello, waving, or giving a high five.

Step 3. Collect Baseline Data
Prior to writing and implementing the social narrative, collect baseline data on the occurrence or absence of the target behavior or skill. This will provide a starting point from which student progress may be measured. Baseline data should be obtained across settings and people.

Step 4. Write the Social Narrative
Write the social narrative by combining two important features. First, include words appropriate for the student's age and comprehension level. Second, write using first or second person.

- First Person: I will raise my hand to get the teacher's attention.
- Second Person: Jill will raise Jill's hand to get the teacher's attention.

Step 5. Choose the Appropriate Length of the Story
Write a story that is appropriate for the student and the skill to be addressed. The number and length of sentences per page in the social narrative will vary based on the student's age and comprehension ability.

Step 6. Include Photos, Picture Icons, or Hand Drawn Pictures
Incorporate visuals to enhance understanding and learning. Use any type of visual that may facilitate comprehension of the social narrative. It may be helpful to include actual pictures of the student performing the target behavior.

Step 7. Implement the Social Narrative
Incorporate the narrative into the daily routine of the student. There are several strategies to ensure it is used throughout the day. The narrative may be read to the student, the student may read the narrative silently, or the student may read the narrative aloud. Provide multiple opportunities for review. Incorporation is often done as a precursor to an upcoming event (i.e., the social situation identified in step one). For example, if a student has a social narrative to support him during recess, the teacher may choose to have him read the social story just before going outside.

Step 8. Monitor Student Progress
Collect data to measure the effectiveness of the intervention on the target skill or behavior for a minimum of two weeks.

Step 9. Review Data and Modify the Narrative if Necessary
Review the data regularly to determine the level of progress being made. If the student is not making adequate progress then changes to the narrative may be necessary. Change only one component of the narrative at a time. For example, a student who reads the story silently may read the story aloud to the teacher or a peer for a time period to see if any changes occur in progress.

Step 10. Address Generalization and Maintenance of Learned Behavior or Skill
Promote the generalization of the skill by including multiple peers or adults in the process. In an effort to promote maintenance of the behavior or skill the narrative is systematically faded by increasing time between readings or changing the method of reading the narrative (read aloud to silent). If the student begins returning to baseline levels following the fading of the narrative the narrative can be reintroduced into the daily routine.

Social Skills Group

Skills or Intervention goals addressed
Social skills groups target the acquisition, performance, and generalization of social skills in students with ASD. Specifically, social skills groups are used to target perspective taking, conversation skills, friendship skills, problem-solving, social competence, emotion recognition, emotion regulation, theory of mind, interaction skills, and problem solving.

Overview
Social skills groups may include two to eight students and an adult facilitator. Groups include instruction on the target skill or skills, role playing or practice, and feedback to assist students in acquiring and practicing skills to promote positive social interactions with peers.

Step 1. Identify the Social Skills Targeted for Instruction

Select the student behavior or behaviors for change based on the IEP and his or her current needs. Despite instruction occurring in a small group format, skills targeted are still individualized based on student need. Objectively define the target skill in observable and measurable terms.

Step 2. Organize Training Groups

Organize students according to similar goals. For example, students focused on conversational skills can be arranged in one group, while students focusing on emotion identification are arranged in another. Adult helpers familiar with ASD are enlisted to support the development and functioning of the social skills group. The ratio of students to adults should be three or four to one to maximize learning opportunities.

Step 3. Collect Baseline Data

Create data sheets and collect baseline data. Data sheets are prepared according to the goals of the student and data is maintained for each member of the group rather than the group at large. The data should be periodically collected, summarized, and graphed to identify student progress or if changes need to be made to the goals or group.

Step 4. Schedule Group Meetings

Schedule group meetings at a time that is mutually convenient and optimal for both students and adults. Considerations for meeting schedules are provided above.

Step 5. Create a Training Format or Structure

Create the training format and group structure that will be used to create instruction. Social skills groups should be formatted to coincide with the developmental needs of the students with ASD. In organizing the structure of the group the following should be outlined:

- dates/times for meetings
- purpose of the sessions
- members in the group
- expectations for the session
- beginning and ending times
- location

Table 20. Considerations for Social Skills Group Meetings

When	· Convenient for all members of the group · Appropriate based on the characteristics of the student · Does not interfere with other critical learning activities
Where	· Safe, supportive setting (e.g., counselor's office) · Minimal distractions · Allows for practice of the skills
How long	· Between 10-90 minutes
How many	· Ongoing if appropriate and needed by student · Minimum of 12 sessions if temporarily offered · Meet weekly at a minimum · Meet multiple times a week (2-5) if appropriate and needed by student

Include the following components in the social skills group structure:

- **introduction/warm-up.** In this phase, everyone settles into the group time. Introductions are made initially, but may need to be repeated for at least the first few sessions if group members do not already know one another. At subsequent meetings, participants can be asked to introduce one another or the time may be used to discuss experiences in using the target social skills from the previous meeting.

- **topic focus.** The group leader introduces the topic or focus of instruction for the session. This component of the session may also be a good time to review skills that were previously learned and to ask about questions or concerns.

- **modeling.** Once the topic for the week has been clearly identified, the target skill is modeled. Modeling may be done by group leaders and helpers, with group members themselves, or with video modeling. The goal of this phase is for group members to observe the target behavior or skill being practiced correctly and successfully. Some groups may find it helpful to have both good and bad examples of the behavior and/or target skill component.

- **practice.** Time is provided for practice of the new skill or behavior, often through role-playing. Students are provided several opportunities to practice the new skill or behavior in the safety of the group. The students may be video recorded (with permission of the student and his/her parent/guardian) as they practice so that they can watch the videos and talk about what they did right and what they might do differently the next time. Videos may also be sent with students so that they can review them outside of group time.

- **coaching/prompting.** The students receive coaching from the leader, helpers, or from each other while practicing. Depending on the skills being taught, the group may go into another environment (e.g., library) and practice the skills while receiving coaching. Regardless of the setting, group members must have someone available to provide support and prompting as needed.

- **feedback/problem solving.** The students receive feedback and problem solve while practicing. To be successful, participants must receive detailed feedback on their use of the target skill or behavior. Leaders and helpers emphasize skills that the participants implemented correctly. For behaviors/skills that need improvement, leaders help students identify corrective strategies and alternative responses.

- **free/snack time.** Because the social skills group should remain a positive and motivating activity for participants, provide reinforcers as a regular part of the session. Reinforcement may be provided at the end of the session, or it may be embedded within the training sessions during a slightly less structured snack time that allows participants to interact with one another without being evaluated.

Step 6. Organize Topics for Instruction

Determine the topics to be addressed during the social skills groups. Break topics of discussion into smaller increments that can be taught sequentially. For example, conversation will need to be broken down into smaller components (e.g., initiations, turn taking, asking questions, terminating). By the end of the group meetings the entire set of skills will be put together to complete the complex skill of having a conversation.

Step 7. Specify Embedded Instructional Strategies or Materials

Identify and incorporate other evidence-based instructional strategies within the social skills group to teach social skills (e.g., social narratives, video modeling). Also use motivational materials and activities to increase student motivation and increase meaningful learning opportunities.

Step 8. Train Helpers Prior to Implementing the Group Instruction

Ensure all staff is prepared to provide group instruction and support. Helpers should possess a basic knowledge and understanding of social skill deficits and strategies used to address these deficits. Additionally, an understanding of the data collection systems is necessary.

Step 9. Implement Social Skills Group Training

Implement the social skills group as planned. The group meets and functions on a regular basis working toward the targeted individual goals of the group members. Avoid cancellations unless an emergency occurs.

Step 10. Collect and Use Data on Target Behaviors to Inform Instructional Decision Making
Collect data on the target skills and the intervention on a regular basis. The data should be periodically summarized to identify student progress or if changes need to be made to the goals or group.

Speech Generating Devices / Voice Output Communication Aids (VOCAs)

Skills or Intervention goals addressed
VOCAs are used as either a supplement or primary method of communication to address challenges with communication in ASD. Areas that may be addressed using VOCAs are teaching the child to become a better communication partner by targeting tacts, mands, and interverbal behavior, creating opportunities to lessen the student's social, communicative, and behavioral difficulties, and developing skills and opportunities to support the student's participation in learning and social activities.

Overview
VOCAs are portable augmentative and alternative communication (AAC) devices that produce synthesized or digitized speech. The devices are designed to be a component of a functional and effective communication system. The devices provide a typical and understandable message and can be programmed to deliver very exact and precise messages to eliminate guessing by the listener as to the speaker's intention. VOCAs are considered high tech AAC devices due to the complex and electronic generated communication they provide. Due to the external device that is required for the production of speech and the inclusion of picture communication boards VOCAs are categorized as Aided AAC systems. For examples of VOCAs, see the section in this document titled "Augmentative and Alternative Communication."

Step 1. Identify and Set Up the Device
Identify the technology-related needs of the student to determine what equipment, if any, is needed to support the student's communication. Complete the following steps:

1. Conduct a proper assessment to ensure the selected system offers a functional and meaningful method of communication. Consideration is given to the student's needs, strengths as well as the features of the technology, characteristics, demands, and suitability for the student and family.
2. Acquire the device and program it to provide the communication used by the student.
3. Introduce the device to the student by having a device with only a few symbols and/or buttons initially. Gradually increase the number of symbols/buttons.

Step 2. Introduce Direct Support Persons to the Device
Identify team members and direct support persons and train them how to use the identified device. Persons using the device participate in training offered by the manufacturer. Designate one team member as the primary contact.

Step 3. Identify Environments Where the Device Will Initially Be Used and the Communication Partners
Introduce the device during familiar routines which allow for frequent communicative attempts (e.g., circle time, English class, snack, lunch, free play). Initial environments should involve routines that provide opportunities for frequent communicative attempts and that are generally positive for the student.

Step 4. Identify Vocabulary Appropriate to the Student and the Environments
Focus on identifying meaningful vocabulary that can be used in the identified environments.

Step 5. Set Up Communicative Opportunities and Teach the Use of the Device
While VOCA use should take place in natural environments, some level of individualized instruction is required to introduce and teach the device. Teach the use of the device by:

1. Arranging opportunities within naturally occurring environments that provide

cues and motivation necessary for communication. Facilitate opportunities through material arrangement and questioning.
2. Teaching peers to use the device.
3. Using prompting.
4. Honoring communicative attempts.

Step 6. Expand Vocabulary
Systematically increase the number of symbols in a single field and increase the number of overlays as the student becomes more proficient with the device.

Step 7. Monitor Student Performance
During implementation, monitor and evaluate the system to ensure the appropriateness of fit and that the communication program is producing desired results.

Stimulus Control

Skills or intervention goals addressed
A behavior is under stimulus control if it only occurs when a particular stimulus is present. Many behaviors may be under stimulus control at any given time. Safety behaviors (stopping at a crosswalk upon seeing the no walk sign) and compliance behaviors (when told to line up the student lines up) are known to be under stimulus control. Stimulus control is also used in teaching methodologies such as discrete trial training (DTT).

Overview
Stimulus control is controlling behavior by the use of a stimulus or cue that indicates the expected behavior should occur. Behaviors will start and stop when these stimuli or cues are present.

It is possible, especially with students with ASD, to attend to unexpected stimuli rather than the appropriate stimulus control. For example, a student learning colors may be able to respond correctly when a particular set of cards are used but appear to lose the skill when generalized to other color stimuli. It is possible that the student has learned characteristics of the card, such as the red card has a bent corner and the green card has a tear in the middle.

Step 1. Teach the Stimulus
Teach the student to discriminate between stimuli and how to respond in the presence of the stimuli. This requires systematically introducing the control by doing the following:

- Begin with one cue (e.g., red versus the red car on the table)
- Begin with functional skills that can be used in routines
- Use simple language (e.g., say "stand up" versus, "Ty, I want you to put that down and then I want you to stand up.")
- Rotate materials to avoid unexpected stimuli control (e.g., when working on red, use many different red items to teach the stimulus control)

Use prompting to teach the appropriate response and fade the prompts appropriately as the student begins to show mastery.

Step 2. Reinforce Appropriate Responding
Reinforce the student for demonstrating the appropriate behavior of the stimulus control.

Step 3. Expand Opportunities
Provide multiple and repeated opportunities to practice the skill and receive reinforcement. Practice the skill across environments, across people, and across materials. Gradually make the stimulus itself more natural helping the student to generalize to other forms of the stimulus. For example, when the student is working on "red," eventually expand the stimulus to "get red" or "where is red." For a student working on responding to "stand up" expand to "time to stand up" or "let's stand up."

Structured Work Systems

Skills or intervention goals addressed
Structured work systems target adaptive behavior skills including on-task behavior, task completion, transitions between tasks, increasing response chain length, and independent performance across curriculum area (e.g., play skills, self-help skills, academic skills). Work systems provide organized strategies for approaching a variety of tasks and

situations in a way that makes them meaningful based on the student's individual learning level. Work systems address the difficulty students with ASD have with time (i.e., beginning, middle, and end) by making the concepts concrete and predictable.

Overview

Structured work systems are an element of structured teaching developed by Division TEACCH (Treatment and Education of Autistic and Communication related handicapped CHildren). The work system is defined as a visually organized space where students independently practice skills that have been previously mastered under the direct supervision of an adult (Mesibov, Shea, & Schopler, 2004). Work systems are critical tools for assisting the student with ASD in understanding the task or activity, staying focused, and completing the task with maximum independence. Work systems answer the following four critically related questions.

1. What task or activity is to be completed?
2. How much work or how many tasks are required during the work period?
3. When is the activity finished?
4. What happens next after the work or activity is completed?

Work systems are typically taught during one-to-one teaching situations using a combination of demonstration, hand over hand assistance, visual prompts, verbal cues, and social praise. The activities and tasks vary during the teaching phase but the system remains constant until the student can follow it independently. Once the student has obtained independence, work systems can be used in one-to-one teaching sessions to learn new tasks and in independent work areas to practice previously learned tasks or activities.

Step 1. Identify Student Learning Skills and Needs

Identify the method by which the student best processes and understands visual information (i.e., pictures, objects, written words). Complete a series of assessments to determine the student's:

- ✶ reading ability,
- ✶ ability to match colors, numbers, and/or shapes,
- ✶ ability to move from one area of the environment to another with little or no adult
- ✶ support,
- ✶ understanding of finished, and
- ✶ ability to participate in organizing his/her work system each day (e.g., written checklist).

Step 2. Create the Work System

Determine components of the work system based on the student's age and work habits. Select one of the following work system formats:

a. Left-to-right. With this format, tasks are placed to the left of the student and the student completes them in any order. Finished tasks are placed in a clear location to the student's right. No sequencing or matching is required.
b. Matching work system. The student matches visual symbols to containers holding tasks and completes them by following the sequenced visual cues. Sequencing and matching are required.
c. Written list work system. With this format, students follow a list of written activities and complete them in order. Sequencing is required. This format is appropriate for students who are able to read and comprehend basic directions.

Complete a task analysis of the work system to identify all of the materials needed to create it. Set up the work system in a quiet area of the room with minimal distractions. Identify the tasks or activities the student will perform in the work system keeping in mind work system activities should offer opportunities to practice previously mastered skills, not to learn new skills or content. Identify the optimal number of activities performed in the work system to ensure the student's success. Table 21 provides descriptions and examples of structured work systems.

Table 21. Examples of Structured Work Systems

Type of Syste	Question	Example
Picture/icon/ object	What task?	Different colored cards are placed left-to-right at the top of the table. Student matches a colored card to a plastic container of the same color holding the work to be completed.
	How much work?	The student knows how much work by the number of colored cards and plastic containers.
	When is work finished?	The student knows work is finished when all cards have been removed and all plastic containers are in the finished basket.
	What happens next?	A picture is placed next to the color cards indicating what the student is to do next.
Written	What task?	Written list of tasks on whiteboard correspond to written words on file folders holding student work.
	How much work?	The student knows how much work by the number of words written on white board and the number of corresponding folders.
	When is work finished?	The student knows work is finished when all the labels of work are crossed off and all folders are placed in the finished tray.
	What happens next?	A written explanation of what the student is to do next is at the bottom of the list on the whiteboard.

Step 3. Teach and Monitor the Work System
Teach the student how to use the work system and monitor his or her progress. This is accomplished by completing the following tasks:

1. Establish periods of the day when the student practices previously mastered skills during "Independent Work Time"
2. Teach the student to transition to the work area through use of a directive, schedule, or other visual support
3. Stand behind the student during work sessions and provide prompts as needed, providing the least intrusive prompts possible
4. Provide reinforcement for successful completion of the work system
5. Collect and analyze data to ensure the student is learning to use the work system independently and is able to maintain independence over time

Step 4. Generalize the Activities
Generalize by introducing new tasks and independent work in the work system.

Task Analysis

Skills or intervention goals addressed
Task analysis is used for any skill that can be broken down in smaller components for teaching in areas of academics, behavior, communication, and social domains.

Overview
Task analysis is the process of breaking large complex skills into smaller more manageable components in order to teach the skill. Other practices such as reinforcement, video modeling, and time delay are incorporated into task analysis to facilitate the learning of smaller steps. As smaller steps are mastered the student becomes increasingly independent in performing the larger skill or task.

Step 1. Identify the Target Skills
Using the student's IEP and current needs identify the skill to be targeted using task analysis. The task should be composed of a series of discrete steps. Keep in mind that a single discrete skill may not require a task analysis. Also, a complex skill with many component parts or multiple outcomes is not suitable for just one task analysis.

Example:	
Too simple:	Turning on a light switch
Just Right:	Making a sandwich
Too Complex:	Washing, drying, and folding clothes

Step 2. Break the Skill into Components
Break the skill into smaller more manageable component steps so the student completes one step at a time of the larger skill. It is important not to overlook small steps when breaking the skills down. It is often necessary to perform the task or observe another person completing the task while writing down the steps.

Example of a Task Analysis: Making Juice

a. Obtains jug, juice powder, measuring cup, and spoon
b. Measures water
c. Pours water in jug
d. Takes cap off powdered juice mix
e. Measures powdered juice mix
f. Pours juice mix into jug of water
g. Places lid back on powdered juice mix container
h. Stirs jug of water with long spoon
i. Puts spoon in the dishwasher
j. Puts measuring cup in dishwasher
k. Puts lid on juice jug
l. Puts juice in refrigerator
m. Puts juice mix in cabinet
n. Wipes down workspace with cloth

Step 3. Confirm the Steps of the Task Analysis
Prior to having the student complete the task analysis, test it on someone else to ensure accuracy. Have the person read and follow the steps verbatim to determine if all steps are there and if any modifications need to occur.

Step 4. Determine How the Skill will be Taught
Determine how the steps in the task analysis will be taught based on the student's qualities, goals, and experiences. Identify the following:

1. The evidence-based strategy that will be used to teach the steps
2. The types and schedule of prompting to be used
3. The types and schedule of reinforcement to implement
4. The best format for the task analysis (e.g., written, pictured based, video model)
5. Whether to use forward or backward chaining to teach the steps in the task analysis

Step 5. Implement the Task Analysis and Monitor Progress
Implement the task analysis based on the steps outlined. Use the identified evidence-based strategy to teach the steps in the sequence. Monitor and evaluate the task analysis to ensure appropriateness and accuracy of steps. Collect data on the student's progress. Analyze data to ensure the student is progressing.

Time Delay

Skills or intervention goals addressed
Time delay can be used to teach virtually any skills, including academic, play/leisure, language/communication, and social skills.

Overview
Time delay is a practice that focuses on fading the use of prompts during instructional activities. This practice is always used in conjunction with prompting procedures such as least-to-most

prompting and graduated guidance. With this procedure, a brief delay is provided between the initial instruction and any prompts. There are two types of time delay procedures: progressive and constant. With progressive time delay, teachers and other practitioners gradually increase the waiting time between an instruction and any prompts that might be used to elicit a response. For example, a teacher provides a prompt immediately after an instruction when a student with ASD is initially learning a skill. As the student becomes more proficient at using the skill, the teacher gradually increases the waiting time between the instruction and the prompt. Similar to progressive time delay, with constant time delay, there is no delay between the instruction and prompt when a student is first learning a skill. However, with constant time delay, a fixed amount of time is always used between the instruction and the prompt as he or she becomes more proficient at using the new skill.

Both progressive and constant time delay procedures include the following three components that comprise a trial: (1) a cue and target stimulus that tell students to use the target skill/behavior, (2) target skill/behavior, and (3) feedback. These three components are critical to implementing time delay procedures effectively. Descriptions of each of these components are provided in the following sections.

Step 1: Identify the Target Skill or Behavior
Define the target behavior or skill that the student with ASD is to acquire. Time delay can be used during didactic instruction to teach discrete skills (e.g., answer questions, point to numerals) during individual work or small group time. However, it also can be embedded into ongoing activities and routines and can be used to teach chained tasks (e.g., putting on coat, washing hands) that are often taught whenever the skill is needed.

Step 2: Identify the Target Stimulus
The target stimulus is the event or thing that cues the student to engage in the target behavior. It may also be known as the instruction or antecedent. Clearly specifying the target stimulus allows the teacher to ensure students are attending and responding to the environment, and helps the teacher to refrain from delivering too many prompts. Target stimuli include:

- **Naturally occurring event**. Examples: Having dirty hands after finger painting is the target stimulus for hand washing; needing to use the bathroom is the target stimulus for asking to use the restroom or moving to the bathroom and using it.

- **Completion of an event or activity**. Examples: Completing an instructional activity is the target stimulus for putting materials away, cleaning up the area, and moving to the area for the next activity; returning from lunch is the target stimulus for sitting at the desk and beginning mathematics.

- **An external signal**. Examples: A ringing bell may signal it is time to go to the next class; the teacher telling the whole class it is time for snack is the target stimulus for putting away work and retrieving the snack.

Step 3: Select the Controlling Prompt to Use
From the array of prompts available (see Prompting section above) select a prompt which ensures that the student with ASD performs the target skill/behavior correctly. This prompt is referred to as the controlling prompt. A controlling prompt elicits the correct behavior on a very consistent basis – nearly every time it is used.

Step 4. Determine the Type of Time Delay and Response Interval
Determine how to use time delay and the procedures to follow by:

1. Determine whether to use constant time delay or progressive time delay. Consider the differences between the two procedures:
   - **Constant Time Delay** - the response interval is a fixed (constant) number of seconds, usually three, four, or five seconds. The same delay is provided between the target stimulus and the controlling prompt.

   - **Progressive Time Delay** - the response interval gradually

(progressively) increases across blocks of trials or sessions as the student demonstrates improvement. The schedule for increasing the response interval can take a variety of forms. The easiest is to increase it by one second each session until it gets to the maximum number provided (typically five or six seconds).

2. Determine the length of the response interval. This decision is based on:
   a. Student characteristics. Consider factors such as how long it usually takes the student to respond when he or she knows how to do the behavior. Adding a couple seconds to this usual time is generally adequate for determining the length of the response interval.
   b. Other students. Consider how long it takes another student with ASD to use a similar skill. For example, if it takes another student four seconds to respond to a verbal prompt, then the teacher might try using four seconds as the response interval for this particular student with ASD.
   c. Task characteristics. Consider the amount of time a student will be allowed to begin a task as well as how long the student will have to complete the task. For tasks that take a longer amount of time to complete, a longer response interval may be appropriate. For tasks that require more than one step (e.g., washing hands), use the same response interval for each step.

Step 5. Implement the Time Delay
Implement the prompting procedure outlined to teach the desired behavior or skill. Use data to determine when to increase the response interval. When first teaching a skill, a fixed zero-second delay is used with both constant and progressive time delay. That is, there is no wait time between the cue and the delivery of the controlling prompt. These sessions are provided for one or two sessions, or until the student responds with 100 percent prompted correct responses. At this time, the response interval is increased and a delay is provided before delivery of the prompt. If students do not respond at the end of the response interval, deliver a controlling prompt to help students use target skills/behaviors correctly. These sessions are used for the remainder of instruction until the student achieves criterion level responding.

- ✶ With constant time delay, implement a fixed delay (i.e., three to five seconds) after using the zero second delay over a predetermined number of trials. The delay provides an opportunity for the student to use the target skill/behavior independently before being offered support from the teacher or practitioner.

- ✶ With progressive time delay, gradually increase the delay (e.g., one second intervals) as students become more proficient at using the target skill/behavior.

Step 6: Monitor Student Performance
Track student responses and type of prompts required to perform the targeted behavior or skill. The prompting required provides valuable information about the student's performance and progress. Review data and modify the program to reflect the progress or lack of progress made. If progress is not at an unacceptable level, consider altering prompting used. If progress has occurred, target skills for generalization.

Video Modeling

Skills or intervention goals addressed
Video modeling can be used to enhance social interactions, communication, leisure activities, or daily self-care routines. Additionally, video modeling is a tool that can be used to reduce anxiety in students and challenging behaviors.

Overview
Video modeling is a mode of teaching that uses video recording and display equipment to provide a visual model of the targeted behavior or skill. Types of video modeling include basic video modeling, video self-

modeling, point-of-view video modeling, and video prompting. Basic video modeling involves recording someone besides the student engaging in the target behavior or skill. The video is then viewed by the student at a later time. Video self-modeling is used to record the student displaying the target skill or behavior and is reviewed later. Point-of-view video modeling is when the target behavior or skill is recorded from the perspective of the student. Video prompting involves breaking the behavior skill into steps and recording each step with incorporated pauses during which the student may attempt the step before viewing subsequent steps. Video prompting may be done with either the student or someone else acting as a model.

Step 1. Select and Define the Behavior to Enhance or Develop

Operationally define the behavior to be targeted in the video so that it is measurable, observable, and specific to the student.

Step 2. Complete a Task Analysis

Itemize the steps of the skill or behavior and determine the sequential order of the actions and scripting to be used in the video.

Step 3. Determine the Details of the Video

Determine the aspects of the video to be used to provide video modeling by completing these steps:

1. Identify the kind of video modeling that is appropriate for the student (basic video modeling, video self-modeling, point-of-view modeling, video prompting).
2. Consider the theme of the conversation or task that is being modeled.
3. Determine the focal point of the video. For example, targeting emotion may require placement of the camera to strategically capture the face, while a video on a self-help skill may be focused on the hands performing the task.
4. Outline the scripting for the video. The actors in the video should be provided a script that explicitly details what is to be said, facial expressions, body posture, and eye contact.
    a. Determine how the exchange will begin and end.
    b. Keep the script short.
    c. Use age appropriate language and skills.
    d. Involve input from parents, teachers, and the child in the development of the script and video.
5. Determine the actors and prepare them for the video.

Step 4. Make the Video

Make the video that will be used to teach a specific skill during the video modeling intervention. Make the video short and include only the steps in the task analysis. Do not include distractions and ensure the background is focused on relevant cues. The actors need to do the following when recording the video:

1. Speak clearly and slowly
2. Exaggerate the target behavior(s)
3. Face the camera
4. Be clear and distinguishable

Edit the video and remove any errors and/or prompts and if necessary, complete voice-overs. Voice-overs may be used to further support the video and increase student comprehension by including narration of the steps.

Step 5. Arrange the Environment for Watching the Video

Arrange the environment so the student can watch the video and learn how to use the target skill. Determine how often, where, and when the video will be shown. The goal of video modeling is to provide opportunities for the student to demonstrate the behavior, therefore, ensure the materials for the performance of the target behavior are available and match those on the video.

Step 6. Watch the Video and Practice the Skill

Show the video multiple times with support. Pause the video during the observation to point out target behaviors and ask questions about the content to increase awareness and understanding. Following the conclusion of the video, debrief with the student to review what has been seen and heard and provide opportunities for the student to perform the target skill.

Step 7. Monitor Progress
Review data and modify the program to reflect the progress or lack of progress made. If progress is not at an unacceptable level, alter instruction. If progress is appropriate, work on generalization of skills.

Visual Supports

Skills or intervention goals addressed
Visual supports target a number of adaptive behavior skills, including task engagement, independent performance, transitions across activities, and increasing response chain length. Visual supports have also proven effective in increasing skills across curriculum areas, including the demonstration of play skills, social interaction skills, and social initiation. In addition, visual supports have been beneficial in reducing self-injurious behavior.

Overview
Visual supports are visual elements added to the environment or instruction to increase awareness and understanding. Visual supports are less fleeting than auditory information as they hold information "still" to allow more time for processing. Visual supports include the use of pictures, written words, and objects to communicate information using the visual-spatial strengths of students with autism.

Step 1. Develop Visual Supports
Determine WHAT information should be presented visually for the student. For example, this may include providing information about an upcoming event, the location of people or classroom materials, or an academic concept. Consider the following questions when determining what activities, events, or concepts may require the use of a visual support:

- Does the activity, event, or concept cause frustration for the student?
- Does the activity, event, or concept cause anxiety for the student?
- Is a great deal of adult support required for the student to be successful with the activity, event, or concept?
- Is the activity, event, or concept difficult for the student to understand when only verbal information is provided?

Conduct individualized assessments of students' comprehension skills to select one of the following forms of visual representation:

- objects (e.g., an empty glue bottle to represent art)
- photographs (e.g., a photo of cafeteria to represent lunch)
- drawing or picture symbols (e.g., drawings of a bus to represent going home)
- words (e.g., the word "reading" can represent time for reading centers)
- combination of the visual forms

Step 2. Organize Visual Supports
Organize the visual supports and related elements for the student required for the activity/ event / target behavior (e.g., classroom labels are properly positioned, calendars are in place, curriculum supports are paired with academic materials).

Step 3. Implement Visual Supports
Show the student the visual support and teach him or her to use it by:

1. Establishing periods of the day when the student practices the skill or uses the support
2. Providing prompts as needed and fading systematically
3. Providing reinforcement for successful use

Step 4. Monitor Student Progress
Collect data on the successful use of the visual support. If the student continues to struggle with understanding and comprehension then it will be necessary to re-evaluate the visual presentation method.

APPENDIX C:
Modifications and Accommodations

Pacing
- ✶ Allow short breaks between activities
- ✶ Modify workload or length of assignments / tests
- ✶ Allow additional time for assignments
- ✶ Assign specific tasks within specific time period
- ✶ Vary activities
- ✶ Provide home set of text/material for preview/review
- ✶ Pre-teach material
- ✶ Avoid timed activities
- ✶ Break material into small parts (chunk information)

Environment
- ✶ Provide preferential seating (classroom, lunchroom, bus, resources, auditorium, etc.)
- ✶ Provide specialized seating
- ✶ Alter room arrangement
- ✶ Define areas concretely (work, personal, materials, etc.)
- ✶ Reduce/minimize distractions: visual, auditory, spatial, movement
- ✶ Use study carrels or room dividers
- ✶ Use headsets or earphones
- ✶ Provide quiet corner/room
- ✶ Modify equipment
- ✶ Provide space for movements or breaks

Motivation and Reinforcement
- ✶ Provide verbal and nonverbal social reinforcement
- ✶ Provide tangible (item or activity) positive reinforcement
- ✶ Use token board
- ✶ Plan motivating sequences of events
- ✶ Offer choices
- ✶ Use varied reinforcement systems
- ✶ Provide noncontingent reinforcement
- ✶ Create a valued task/job

Socialization
- ✶ Train and use peer tutors
- ✶ Structure activities to create opportunities for social interactions
- ✶ Use cooperative learning groups
- ✶ Alternate quiet and active time
- ✶ Provide circle of friends
- ✶ Provide peer buddies
- ✶ Provide counseling or social skills groups
- ✶ Teach about differences/disabilities
- ✶ Allow opportunities to help other students

Behavior
- ✶ Make expectations concrete and visual
- ✶ Use rule cards (picture or text)
- ✶ Provide visual cues for appropriate behavior
- ✶ Provide reinforcement (see section on Motivation and Reinforcement)
- ✶ Offer choices
- ✶ Provide breaks
- ✶ Use schedules
- ✶ Use timer
- ✶ Use behavior chart
- ✶ Use token board
- ✶ Use emotion / personal state indicator (e.g., thermometer, scale)

Transition
- ✶ Give notice, warning before change in activities
- ✶ Provide verbal and visual cues regarding transition
- ✶ Use timer or other indicator of termination of activity
- ✶ Use daily and mini schedules
- ✶ Utilize specific routine sequences
- ✶ Use rule cards (picture or text)
- ✶ Utilize transition item (e.g., small toy, gel ball)

Materials
- ✶ Rearrange material on the page
- ✶ Use taped texts and/or other class materials
- ✶ Highlight texts / study guides
- ✶ Color code materials
- ✶ Provide supplementary materials (e.g., additional book, pictures)
- ✶ Use large print

- ✶ Use assistive technology (AT) including special equipment, calculators, electronics, video recorders, software, Web sites
- ✶ Use augmentative and alternative communication (AAC)
- ✶ Use manipulatives
- ✶ Use pictures

Testing

- ✶ Allow tests/ projects to be taken orally
- ✶ Add pictures/visuals to test
- ✶ Read test to student
- ✶ Give applications in real setting
- ✶ Modify format (multiple choice, essay, true / false)
- ✶ Shorten length of test
- ✶ Extend time frame; allow untimed testing
- ✶ Modify grading
- ✶ Allow for oral responses
- ✶ Allow frequent rest breaks
- ✶ Allow open book or open note tests
- ✶ Provide study guide prior to test
- ✶ Highlight key directions
- ✶ Give test in alternative site
- ✶ Allow calculator, word processor

Assignments

- ✶ Give directions in small, discrete steps
- ✶ Give directions in alternate format (written, taped, pictures)
- ✶ Allow student to record or type assignments
- ✶ Adapt writing utensils
- ✶ Use wedges or clip boards
- ✶ Shorten length of assignments
- ✶ Reduce paper and pencil tasks
- ✶ Adapt worksheets/packets
- ✶ Change difficulty level of assignments
- ✶ Highlight response locations or directions on assignment
- ✶ Adapt assignment to accommodate use of large print
- ✶ Break assignment into small parts (chunk information)
- ✶ Allow sensory breaks or provide sensory input
- ✶ Complete assignment in quiet location

Self- and Time Management

- ✶ Use visual daily and mini schedules
- ✶ Use calendars
- ✶ Provide agenda book
- ✶ Provide checklists
- ✶ Use PDAs or smart phones for monitoring
- ✶ Provide visual cues for appropriate on-task behavior
- ✶ Use timer
- ✶ Break task or assignment into small parts
- ✶ Allow activity breaks
- ✶ Use long-term assignment timelines
- ✶ Follow routines or schedules
- ✶ Provide daily check-in with case manager, mentor or special education teacher
- ✶ Use self-monitoring and self-management
- ✶ Use reinforcement (see Motivation and Reinforcement)
- ✶ Plan motivating sequence of events

Presentation of Subject Matter

- ✶ Teach to student's learning style: linguistic, logical / mathematics, musical, spatial, bodily / kinesthetic
- ✶ Tape lectures / discussion for replay
- ✶ Provide note-taking support
- ✶ Provide copy of lecture notes (peer or adult provide)
- ✶ Utilize manipulatives
- ✶ Highlight / underline critical information
- ✶ Pre-teach content
- ✶ Make/use vocabulary files
- ✶ Reduce language levels or reading levels of assignments
- ✶ Use visual sequences
- ✶ Use assistive technology (AT) including special equipment, calculators, electronics, video recorders, software, Web sites
- ✶ Use augmentative and alternative communication (AAC)
- ✶ Use cooperative learning groups
- ✶ Provide peer tutoring
- ✶ Utilize resource staff

Home support / Homework

- ✶ Provide a second set of materials for home
- ✶ Provide parent training
- ✶ Use a home-school communication log
- ✶ Have parents preview or review materials
- ✶ Provide homework description

APPENDIX D:
Assistive Technology Planning Form Example

Select instructional areas from the first column which are appropriate for the student. Specify skills needed in each area (e.g., copy assignment from board, complete mathematics assignment, turn take with peer) and indicate the manner in which the student currently performs these skills. In the fourth column, specify the AT tools that will increase student performance in this area. In the final column, indicate any additional services or supports that may be needed to implement the AT effectively.

Student Name:_____ Grade:_____ Date:_____

Instructional Area	What do you want the student to do?	What does the student currently do?	AT tools and strategies needed	Additional AT services needed
Writing				
Spelling				
Reading				
Mathematics				
Fine Motor Tasks				
Gross Motor Tasks				
Study Skills				
Listening				
Communication				
Socialization				
Behavior				
Dressing				

Assistive Technology Planning Form Example *continued*

Student Name:_____ Grade:_____ Date:_____

Instructional Area	What do you want the student to do?	What does the student currently do?	AT tools and strategies needed	Additional AT services needed
Toileting				
Eating				
Sensory				
Recreation and Play				
Positioning and Seating				
Routines / Activity Completion				
Computer Access				

APPENDIX E:
Educational Team Planning Form Example

Student: _____ Date: _____

Team Members Present:

Name_____ Position_____

Name_____ Position_____

Name_____ Position_____

Issue to be Resolved	Suggested Resolution Options	Steps to Resolution	By Whom	By When	Date Completed
Johnny does not turn in homework in mathematics.	1. Limit amount of homework 2. Special education teacher goes to general education classroom at 3:15 to help him write down homework and gather supplies. 3. Teacher writes homework assignment in communication log.	1. Teacher providing support in classroom to write down homework and gather supplies. 2. Teacher writes homework assignment in daily communication log.	Mrs. Adams	3/24/11	

Follow Up	Meeting scheduled for 3/24/2011 to review homework progress. Alternate options will be discussed if progress has failed to be achieved through support of special education teacher.

APPENDIX F:
Home-School Communication Form Example

SCHOOL NOTES	HOME NOTES
Daily Events	**Daily Events**
Skills Targeted / Progress Made	**Accomplishments**
Behavior (Positive and Negative)	**Behavior (Positive and Negative)**
Related Service Notes	**Notes for Related Service Personnel**
Other Notes	**Other Notes**