

Assistive Technology Supports for Individuals with Autism Spectrum Disorder



Wisconsin Assistive Technology Initiative
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Dear Colleague:

Thank you for your interest in the Wisconsin Assistive Technology Initiative's *Assistive Technology Supports for Individuals with Autism Spectrum Disorder*. This assistive technology (AT) guide is designed to help educators assess the impact of various items in the environment on their students with ASD and to support the exploration and use of other tools and strategies that may work more effectively for those students. This is a revision of the manual first published in 2000.

In this guide you will find:

Student Information Guide for Students with Autism Spectrum Disorder (ASD)-The Student Information Guide is a tool used to gather information about a student with ASD. The information is directly related to choosing assistive technology which might prove useful. It is completed based on past experience; file review, interview, and/or direct assessment of the child.

Environmental Observation Guide for Students with ASD-The Environmental Observation Guide is another information-gathering tool. It is used to gather information from the various environments in which the child is expected to function.

Assistive Technology Decision-Making Guide for Students with ASD and Directions-The AT Decision Making Guide is a team decision-making guide that will lead your team through the process of making a decision about assistive technology tools and strategies based on the information you gathered with the Student Information Guide and Environmental Observation Guide.

AT Tools and Strategies for Students with ASD-The AT Tools and Strategies section is a description of many low, mid, and high tech tools that have proven useful with students with ASD. It was developed by Susan Stokes. A separate References and Resources section includes a reference list, list of vendors and a list of helpful web resources.

We wish to recognize the many people who have over the years made contributions to this Autism Manual. Three of these key people are; Mary Wirkus, Western Technical College Instructor, Penny Reed, WATI Director Emeritus, and Susan Stokes, Autism Coordinator, CESA 6. You will find the richness of their work within these pages. And finally many thanks to Peggy Strong, CESA #2, for her creative energy in editing and formatting this version of the Autism manual.

We hope this material supports your work with students who experience ASD.

Sincerely,
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Assistive Technology Supports for Individuals with Autism Spectrum Disorder

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This resource guide includes “light bulbs” that highlight a specific resource, product, or methodology.

Section 1-
Student Information
Guide

Student Information Guide for Individuals with Autism Spectrum Disorder

This student information guide was developed for use by school district teams to gather information, which will help articulate specific areas of need. The responses to the questions below will be used during the team problem solving process. This information may be gathered through file review, interview, formal or informal assessment, or recall of personal experiences with the student.

Describe the student's abilities and difficulties related to each area.

Sensory:

Due to difficulty in organizing sensory input, both hypersensitive (e.g., over-sensitive, seeking less stimulation) and hyposensitive (e.g., under-sensitive, seeking more stimulation) responses to various sensory stimuli can be present. Check all that apply to this student:

Sensory System Hypersensitive Response / Hyposensitive Response		
Sensory System		
Touch (tactile)	Avoids touch	<input type="checkbox"/>
	Aversive reaction to getting dirty or certain textures	<input type="checkbox"/>
	Has trouble sitting on some rugs and upholstery	<input type="checkbox"/>
	Bothered by certain clothing (socks, underwear, jeans)	<input type="checkbox"/>
	Touches everything	<input type="checkbox"/>
	Chews on inedible objects	<input type="checkbox"/>
	Little reaction to pain	<input type="checkbox"/>
	Does not react to extreme differences in texture	<input type="checkbox"/>
Movement (vestibular)	Avoids unexpected movement	<input type="checkbox"/>
	Seeks slow movement	<input type="checkbox"/>
	Cautious of anything other than walking on flat surface (e.g., avoids running, climbing, sliding, swinging)	<input type="checkbox"/>
	Gets car sick	<input type="checkbox"/>
	Craves physical activity	<input type="checkbox"/>
	May move constantly	<input type="checkbox"/>
	Enjoys spinning, swinging, rocking - without apparent dizziness	<input type="checkbox"/>
Body Position (proprioceptive)	Rigid, tense, stiff, uncoordinated	<input type="checkbox"/>
	May slump, slouch or stamp feet	<input type="checkbox"/>
	Unaware of where body is in space	<input type="checkbox"/>
	Clumsy	<input type="checkbox"/>
	May seek deep pressure	<input type="checkbox"/>

Deep pressure examples: _____

Sensory System Hypersensitive Response / Hyposensitive Response (cont.)		
Sight (visual)	May close eyes when overexcited	<input type="checkbox"/>
	May be inattentive to tasks	<input type="checkbox"/>
	Overreacts to bright lights	<input type="checkbox"/>
	May resist going to area with colorful rug or bulletin board	<input type="checkbox"/>
	Seeks out visual stimulation by throwing/spinning objects	<input type="checkbox"/>
	Stares at bright lights (fluorescent lights)	<input type="checkbox"/>
	Flicks fingers in front of eyes	<input type="checkbox"/>
	When anxious, may have extra sensitive peripheral vision	<input type="checkbox"/>
Sound (auditory)	Covers ears frequently	<input type="checkbox"/>
	Over-reactive to both (auditory) loud (fire alarms) and soft (computer hum) sounds	<input type="checkbox"/>
	Tunes out or does not respond to sounds	<input type="checkbox"/>
	Turns T.V. or music loud	<input type="checkbox"/>
	May speak loudly	<input type="checkbox"/>
Smell (olfactory)	Notices and objects to barely perceptible odors both pleasant (foods/perfumes) and unpleasant	<input type="checkbox"/>
	Does not react to unpleasant odors	<input type="checkbox"/>
	May sniff food, people, and objects (i.e., winter boots)	<input type="checkbox"/>
Taste	Picky eater, strongly reacts (gags) to certain foods	<input type="checkbox"/>
	May lick or taste inedible objects	<input type="checkbox"/>
	May prefer spicy or hot foods	<input type="checkbox"/>
	Chooses food based on texture	<input type="checkbox"/>
Multisensory	Avoids or becomes agitated by crowded spaces (auditoriums)	<input type="checkbox"/>
	Avoids or becomes agitated by open spaces (gymnasiums)	<input type="checkbox"/>
	Avoids large spaces	<input type="checkbox"/>
	Avoids small spaces	<input type="checkbox"/>
	Seeks small spaces (tents, under stairs, closets)	<input type="checkbox"/>

Many children are bothered by sensory stimuli to some degree, but often children with sensory differences take much longer to recover from the experience.

What sensory strategies are calming to the student?

Examples: _____

What sensory experiences are over-arousing to the student?

Examples: _____

Does the student have a sensory diet? Yes No

Is it implemented by someone other than the student? Yes No

Describe the sensory diet:



The sensory diet, a term coined by Patricia Wilbarger, OT, is a carefully designed, personalized activity schedule that provides the sensory input a person's nervous system needs to stay focused and organized throughout the day.

Motor:

Autism is a pervasive developmental disorder. This means that most people on the autism spectrum have delays, differences or disorders in many areas -- including gross and fine motor skills. Children on the spectrum may have low muscle tone, or have a tough time with coordination, have underlying sensory issues and/or emotional issues that impact their motor skills. At times it may appear that there are uneven patterns of development, as a child may be an excellent detailed drawer but have poor handwriting skills (also known as dysgraphia).



“Dysgraphia” is a deficiency in the ability to write, regardless of the ability to read, not due to intellectual impairment. People with dysgraphia often can write on some level, but often lack co-ordination, and may find other fine motor tasks such as tying shoes difficult. It often does not affect all fine motor skills. They can also lack basic spelling skills (having difficulties with p, q, b, d), and often will write the wrong word when trying to formulate thoughts (on paper).

How does the student's motor (e.g. fine, gross, oral, visual) affect his or her active participation within the school, home, and community environments?

Motor skills:

Check the skills that are difficult.

Are these difficulties due to underlying causes?

Fine Motor	
Writing	<input type="checkbox"/>
Computer use	<input type="checkbox"/>
Cutting	<input type="checkbox"/>
Drawing	<input type="checkbox"/>
Buttoning	<input type="checkbox"/>
Zippering	<input type="checkbox"/>
Snapping	<input type="checkbox"/>
Tying shoe	<input type="checkbox"/>
Using eating utensils	<input type="checkbox"/>
Oral motor	
Chewing	<input type="checkbox"/>
Swallowing	<input type="checkbox"/>
Droling	<input type="checkbox"/>
Preference to certain textures	<input type="checkbox"/>
Gross motor	
Gymnastics	<input type="checkbox"/>
Team sports	<input type="checkbox"/>
Ball skills	<input type="checkbox"/>
Open stairways	<input type="checkbox"/>
Standing in line	<input type="checkbox"/>
Visual motor	
Near copying	<input type="checkbox"/>
Far copying	<input type="checkbox"/>
Ball skills	<input type="checkbox"/>
Crossing the midline	<input type="checkbox"/>

Weakness	<input type="checkbox"/>
Clumsiness	<input type="checkbox"/>
Low tone	<input type="checkbox"/>
Doesn't appear to know his/her own strength	<input type="checkbox"/>
Fear	<input type="checkbox"/>
Decreased motor planning (dyspraxia)	<input type="checkbox"/>
Eyes and hands don't work well together	<input type="checkbox"/>
Rigidity	<input type="checkbox"/>
Lack of coordination	<input type="checkbox"/>
Dysgraphia	<input type="checkbox"/>
Need for perfection	<input type="checkbox"/>

Expressive Communication:

- Does the student exhibit communicative intent (e.g., understands that pointing, making a vocalization or word will result in a response)?
- What forms/modes of communication does the student currently use? Check all that apply:
 - Motoric:** direct physical manipulation of a person or object (e.g., taking a person's hand and pushing it towards a desired item; giving a cup to a caregiver to indicate "want milk").
 - Gestural:** pointing, showing, gaze shift (e.g., student looks or points at a desired object and then looks at another person to engage his or her attention to the communicative act of requesting).
 - Vocalization:** use of sounds, including crying to communicate (e.g., student says "ah-ah-ah" to draw another person's attention to him or her).
 - Sign language:** communication with conventional signs such as Signed English, American Sign Language, or an adapted version of sign (e.g., student places fingertips of one hand to mouth to indicate "eat").
 - Object:** student hands an object to another person to communicate (e.g., student hands a cup to the parent to indicate "want drink"). Student uses a picture exchange system, handing a picture/symbol or photo to another person to communicate "want cracker."
 - TOBI (true object-based icons):** student hands photograph which is cut out in the actual shape or outline of the item it represents to another person to communicate.
 - Photo:** use of two-dimensional photographs to communicate (e.g., student points to or hands photographs of various objects, actions, or events to communicate his or her desires).
 - Pictorial:** use of two-dimensional drawings that represent objects, actions, or events (e.g., student hands a line drawing of a "swing" to adult to indicate that he or she want to swing).
 - Written:** use of the printed words or phrases to communicate (e.g., student writes "too loud" to indicate that the noise level in the environment is bothering him or her).
 - Verbal:** student is able to verbally communicate which purposes of communication?
 - Student communicates wants and needs (e.g., "I want more milk.").
 - Student exchanges information (e.g., "It's cold today.").
 - Student socially interacts (e.g., "How was your weekend?").
 - Student uses appropriate social etiquette ("please", "excuse me," does not interrupt, uses appropriate volume, tone of voice, appropriate personal space with others).

How does the student use his/her language to communicate? Please complete the following chart (listed hierarchically from least social to most social functions):

Uses the following functions	Always	Frequently	Occasionally	Seldom	Never	Current process used
Requests objects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Requests actions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Requests assistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Protests/rejects object	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Protests/rejects action	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Requests special routines: (e.g., to play "peek-a-boo")	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Requests comfort: (e.g., to be held when distressed)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Greets others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Calls attention: (e.g., calls attention to self through calling others)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Comments: (e.g., draws another person's attention to an object, action, or event)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Requests information from others: (e.g., asks "Where did you go?")	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Give information to others: (e.g., gives information about something that is not obvious or known to another person)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Does the form or mode the student currently uses for each of the above functions (pointing, gesturing, exchanging symbols, using a device) meet his or her needs? If not, what form might be more appropriate?

Does the student currently use an augmentative/alternative communication system? (e.g., Picture Exchange Communication System (PECS); object exchange; TOBIs; picture communication board or book; voice output devices; electronic/alternative keyboard or computer)

If yes, which have been tried? _____

For how long: _____

With what degree of success? _____

If no, which has the team discussed putting in place? _____

What types and arrangements of communication displays have been utilized and which have been the most successful or unsuccessful?

Consider how the student has reacted to the following elements:

- Size of display
- Arrangement (grammatical, do we keep symbols in same place--**help, all done, I want**)
- Orientation (left to right or vertical)
- Glare vs. non-glare (use of laminating products and/or sheet protectors may promote a glare)
- What size/color borders
- Color of background vs. color of picture vs. black/white
- Does this board lend itself to opportunities for growth

Does the student...? (Check all that apply)

- Initiate conversations

If so, how and what topics? _____

- Maintain conversations
(Participates as both speaker and listener across several conversational turns)

- Terminate conversations

If so, how? _____

What causes expressive communication breakdowns? (e.g., student does not recognize looks of confusion or inattentiveness on the face of a listener or does not adjust message accordingly)

When expressive communication breakdowns occur, does the student use any communication repair strategies? (e.g., repeat his or her communicative attempt if the communication partner does not initially understand; "show" the communication partner what he or she is talking about; use an alternative way to communicate, such as pictures or writing, etc.).

What types of strategies do successful communication partners (teachers, parents/caregivers, peers, siblings) use with this student? _____

Is the student able to express his/her personal preferences or needs (e.g., increased processing time, sensory issues related to the environment, preferred learning style, etc.)?

Receptive Communication:

What causes receptive communication breakdowns (e.g., difficulty understanding or processing verbal information)? _____

How does the student react to unfamiliar people or places and unexpected change?

Do you feel the student understands the expectations in all environments (and adults) within and out of the classroom (e.g., bus, playground, art, phy. ed., extracurricular activities)?

Yes No

When receptive communication breakdowns occur, does the student use any communication repair strategies? (e.g., the student says, "I don't understand" or "Please say that again" when a breakdown occurs in receiving information). _____

Does the student seem to understand (and/or successfully utilize) visual representation system(s)? Check all that apply:

Visual Representation	Uses regularly	Has tried briefly	Has not tried
Real objects: (e.g., recognizes use of shoes to indicate wanting to go outside.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Partial objects: (e.g., understands that the handle of a cup can represent the entire cup)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Miniature real objects: (e.g., understands a miniature cup represents wanting a drink.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
True Object-Based Icons (TOBI): (e.g., recognizes a line drawing, photograph, etc., which is cut out in the actual shape or outline of the item it represents.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Photos: (e.g., understands a photograph of an action or object is a representation of the real object, action or event.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Real drawings: (e.g., understands a drawing of an object, action or event represents the real object, action or event.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Line drawings: (e.g., recognizes a simple line drawing of an action or object as representing the real object, action or event.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Written word: (e.g., understands written words.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do visual support strategies facilitate the student's ability to better understand what is expected of him/her in various environments? Yes No

If so, list visual support strategies currently used (e.g., schedules, calendars, activity schedules, visual directions, universal "no", visual rules, Social Stories, social scripts, "wait", turn-taking).

Task/activity visual support is needed for: _____

Type of tool created: _____

When was it taught? _____

Taught by whom? _____

Length of time tool was used: _____

Success/failure due to: _____

Academic:

List the student's academic strengths: _____

List the student's preferences/likes (topics, areas of interest): _____

List the student's academic weaknesses: _____

What tools or strategies have been successful in supporting the student in regular or special education classes? (e.g., modified assignments, use of visual support strategies (such as Social Stories, social rule cards, object schedule), modified environments, notes given in advance, use of peer models, incorporate high interests, portable word processor, computer, etc.).

Organization:

	Yes	No
Does the student exhibit difficulties in organization of self or his/her environment? (e.g., losing papers, trouble getting to school on time, etc.)	<input type="checkbox"/>	<input type="checkbox"/>
Does the student have trouble comprehending how much time a project will take?	<input type="checkbox"/>	<input type="checkbox"/>
Does the student have difficulty with strategies for memorization and retrieving information from memory?	<input type="checkbox"/>	<input type="checkbox"/>
Does the student have difficulty initiating activities or generating ideas?	<input type="checkbox"/>	<input type="checkbox"/>
Does the student have difficulty retaining information?	<input type="checkbox"/>	<input type="checkbox"/>
Does the student have difficulty retaining information while doing something else? (e.g., remembering a phone number while dialing)	<input type="checkbox"/>	<input type="checkbox"/>



"Executive Function" is a term used to describe a set of mental processes that helps us connect past experience with present action. We use executive function when we perform such activities as planning, organizing, strategizing and paying attention to and remembering details. (source: www.nclld.org)

People with executive function problems have difficulty with planning, organizing and managing time and space. They also show weakness with "working memory" (or "seeing in your mind's eye"), which is an important tool in guiding one's actions.

Behavior:

How does the student's behavior affect his or her active participation in situations and activities?

How does the student self-regulate challenging behavior?

What challenging behaviors does the student currently exhibit? Answer the following questions regarding each challenging behavior):

What behavior occurred?

Where it occurred?

With whom it occurred?

How long it lasted?

What happened after it occurred?

What is the function/cause of the behavior? (e.g., sensory issue, lack of communication, lack of understanding of expectation, task lacks meaning to the student, etc.)

What proactive positive supports have been used for increased student success? (e.g., picture or printed schedules, visual prompts, environmental adaptations, sensory diets, "quiet" area, forewarning/foreshadowing change, etc.)

Does the student have a high interest topic that you could use in a positive manner? (e.g., weather, geography, astronomy, etc.)

Do you believe that any of the following contribute to the occurrence of challenging behaviors?

	Yes	No
Communication difficulties (both receptive and expressive)	<input type="checkbox"/>	<input type="checkbox"/>
Social relation difficulties	<input type="checkbox"/>	<input type="checkbox"/>
Sensory processing difficulties	<input type="checkbox"/>	<input type="checkbox"/>
Lack of motivation/interest for task or activity	<input type="checkbox"/>	<input type="checkbox"/>
Behavioral repertoire:		
Insistence on sameness with adverse reaction to change	<input type="checkbox"/>	<input type="checkbox"/>
Preference for routines	<input type="checkbox"/>	<input type="checkbox"/>
Distractibility	<input type="checkbox"/>	<input type="checkbox"/>
Varied attending skills	<input type="checkbox"/>	<input type="checkbox"/>
Repetitive-type behaviors	<input type="checkbox"/>	<input type="checkbox"/>
Perseverative behaviors	<input type="checkbox"/>	<input type="checkbox"/>

Social Interaction:

What social skills does the student appropriately use?

Check all that apply and note an example for each one checked:

	Example	
Shows interest in being with or observing others	<input type="checkbox"/>	
Displays age-appropriate social interaction skills, including during play or leisure time	<input type="checkbox"/>	
Orients toward an individual who may serve as a base of security. What occurs when this individual is absent?	<input type="checkbox"/>	
Is able to establish and maintain shared attention with others	<input type="checkbox"/>	
Uses appropriate tone, volume of voice	<input type="checkbox"/>	
Uses appropriate eye contact	<input type="checkbox"/>	
Able to model and imitate the play/leisure skills of others	<input type="checkbox"/>	
Is able to express emotions in a readable and appropriate manner	<input type="checkbox"/>	
Understands rules of social behavior in different settings and responds accordingly	<input type="checkbox"/>	
Is able to recognize and understand the emotions being communicated by others	<input type="checkbox"/>	
Does the student understand the "hidden curriculum"	<input type="checkbox"/>	



Does the student understand "hidden curriculum?" (Brenda Smith Myles, 2001, Bieber, 1994) List areas of priority regarding hidden curriculum work: the set of unwritten rules that no one has been directly taught, but everyone knows. ("Don't tell jokes about body parts to your teacher.") Violations of these rules can make one a social outcast.

What opportunities does the student have for social interaction with peers, and in what environments do these occur (e.g. bus, playground, classroom, lunchroom)?

Does the student understand that others can have thoughts, ideas, desires, intentions and beliefs different from his or her own (e.g., "Theory of Mind")? Is the student able to take the perspective of others (e.g., "Mind Reading")? If there are difficulties, please explain.

What supports have been used for increased student success in social situations (e.g., peer models, Carol Gray's Social Stories/Comic Strip Conversations, videotaping, etc.)?

Transitions:

How does the student react to planned transitions? Are some transitions more successful than others? If so, try to identify and list the differences.

How does the student react to unexpected changes in the environment or schedule (e.g., changes of routine, new people, cancellation of a favorite activity, physical rearrangement of furniture, changed placement of smaller items in the room such as puzzles on the "block" shelf)?

What proactive positive supports for transition, if any, have been built in for increased student success (e.g., picture or printed schedules, visual prompts, forewarning/foreshadowing change)?

What tools or strategies have been successfully used to support organization (e.g., color-coded folders, highlighting tape, etc.)?

Section 2-
Environmental
Observation Guide

Environmental Observation Guide for Individuals with Autism Spectrum Disorder

This Environmental Observation Guide is the second tool designed to help gather important information. The information from this tool will be used during the team problem solving process to identify potential assistive technology.

Describe the environments in which the student learns, works, lives, and plays on a daily basis. Observe in at least two environments. Use a separate sheet for each environment.

Auditory and Visual Stimulation: What are the auditory and visual stimulation levels in the room? (Is there noise from other classrooms, the hallway, the street? Are there colorful pictures, rugs, artwork hanging from the ceiling, cluttered workspaces, etc.?)

Boundaries: Have clear physical and visual boundaries been defined within each room through the arrangement of furniture and materials? (Examples might include space that belongs to the teacher, the space one stands in when washing hands, the area where one goes for story time, cubby/locker space, a place to stand in the gym for exercises, etc.) If so, please describe how boundaries are defined.

Staff Placement and Responsibility: How far from the student do the staff members typically stand? To whom is the student accountable (e.g., teacher, paraprofessional, therapist)?

Schedules: Are visual schedules utilizing objects, pictures, or words, for either the target student or all students, in place where everyone can see them and change them as needed, and are they utilized by all staff members (e.g., teachers, paraprofessionals, itinerant teachers/therapists, substitute staff, etc.)?

Access to Communication Aids: If needed, does the student have access to communication augmentation (e.g., pictures, symbols or printed words on cards, boards, PECS or devices) for requesting, rejecting, commenting, etc., in this environment?

Visual Tools and Strategies for Understanding Information: Are there various visual support strategies present in the classroom to give the student information to help him or her understand the expectations of that environment (e.g., pictures of materials to define where materials belong, areas of the classroom visually labeled, visual directions provided for tasks)?

Environmental Consistency: Consider all teachers, paraprofessionals, itinerant staff, bus drivers, family members, troop leaders, etc. (Adapted from Adams, 1992)

- Does the adult always have the student's attention before directions are given?
- Is the verbal language that is used commensurate with the student's level of understanding?
- Are verbal information and requests supplemented with gestures and facial expressions?
- Does it appear that the student is given enough information (verbal and visual) to complete tasks? If not, are visual support tools and strategies being used consistently and appropriately by everyone?
- Are appropriate prompts and reinforcements chosen commensurate with the student's learning style and language, cognitive, and social skill levels?
- Is the student given clear feedback regarding correct and incorrect responses and behaviors?
- Are consequences and reinforcers for behaviors made clear and provided immediately following the behavior? If yes, how?
- Is feedback consistent among all individuals within the student's environment?

Section 3-
Assistive Technology
Decision Making Guide

The Wisconsin Assistive Technology Decision Making Guide for Individuals with Autism Spectrum Disorder

The following Guide is a chart of the decision making process. It is the same process we utilize when considering the assistive technology needs of any person who needs support to complete an identified task. To better support individuals on the spectrum, questions specific to their sensory needs were developed and are presented for consideration. For more general information on our Assessing Students Need for Assistive Technology (ASNAT) process please see the ASNAT manual posted on our website at www.wati.org

The directions for utilizing the guide found on page 2 continue on pages 3, 4 & 5.

WATI Assistive Technology Decision Making Guide For Individuals with Autism Spectrum Disorder

Area of Concern: _____

PROBLEM IDENTIFICATION

Student's Abilities/Difficulties	Environmental Considerations	Tasks
What are the student's abilities and difficulties? <ul style="list-style-type: none"> • Communication • Academic • Motor • Behavior • Organization • Social Interactions • Transitions • Other concerns 	What environmental considerations impact the student's participation? <ul style="list-style-type: none"> • Auditory Stimulation • Does student have clear boundaries? • Staff placement, support, and consistency • Visual schedules used • Engineered for Communication • Visual clutter • Lighting • Computer operating system • Current or past AT used • Other concerns 	What task(s) do you want the student to do? <ul style="list-style-type: none"> • Tolerate Stimuli • Verbal communication • Written communication • Academic participation • Navigate in Environments • Behave within Expected Parameters • Interact Socially • Transition
Sensory Considerations		Narrowing the Focus
What sensory challenges does the student have? <ul style="list-style-type: none"> • Visual, auditory, tactile, etc. 		e.g., identify specific task(s) for solution generation
Solution Generation Tools & Strategies	Solution Selection Tools & Strategies	Implementation Plan
Brainstorming only--no decisions yet	Use a feature match process to discuss and select idea(s) from solution generation	AT Trials/Services Needed: <ul style="list-style-type: none"> • Formulate objectives to determine effectiveness of trial • Training needed • Date • Length • Person(s) Responsible
		Follow-Up Plan
		Who and When <ul style="list-style-type: none"> • Set specific date now

Important: It is intended that you use this table as a guide. Each topic should be written in large print where everyone can see it; for example, on a flip chart or board. Information should then be transferred to paper for distribution, file, and future reference.

Directions for Using the Assistive Technology Decision Making Guide For Individuals with Autism Spectrum Disorder

The decision making guide was developed to help articulate specific needs, identify solutions (including both tools and strategies) to meet those needs, and develop an implementation plan to carry out the proposed solutions. The entire team, including the parents, should be involved in this decision making process. Following the format of the Assistive Technology Planning Guide, the responses to the topics below should be written on a flip chart, overhead projector, or white board to create a shared group memory and to ensure accuracy of information. It should then be copied and placed in the student's file for future reference.

THE STUDENT: Using the information gathered with the Student Information Guide, describe the student's abilities and difficulties related to each area.

- **Sensory:** Ability to organize sensory input, including hypersensitivity or hyposensitivity, calming strategies, and causes of overload
- **Motor:** Effect on active participation within various environments
- **Communication:** Methods used, causes of communication breakdowns, strategies for repair
- **Academic:** Student's strengths and weaknesses, participation and nonparticipation in regular education
- **Organization:** Student's ability to plan assignment timelines, to memorize and retrieve information, to initiate tasks and generate ideas
- **Behavior:** Reactions to changes in environment including personnel, inappropriate behaviors and when they occur, interventions used (including support strategies)
- **Social Interaction:** Relating to others, recognition of emotions in others, communicating emotions, interacting with peers
- **Transitions:** Reaction to termination of activities, transitions, and changes in the environment

THE ENVIRONMENT: Describe the information gathered using the Environmental Observation Guide in the environments in which the student learns, works, lives, and plays on a daily basis.

- **Auditory and Visual Stimulation:** In various environments, impact of different levels
- **Boundaries:** Determined within various environments
- **Staff Placement:** Distance from student, accountability
- **Schedules and other Visual Supports:** In place, utilized
- **Access to Communication:** Available, utilized
- **Environmental Consistency:** Consistent, reliable instructions and reinforcements

TASKS: In each area, describe which task the team members would like the student to be able to do. After tasks have been listed, members should prioritize tasks and work with one or two tasks at a time. These suggested tasks are to be used only as a guide; please determine your tasks based on the abilities and needs of your own student.

- **Process Sensory Stimuli:** Do you want the student to tolerate different textures/types of food, participate in activities in the gymnasium without becoming overwhelmed with noise or lights, wear different types of clothing, etc.?
- **Communicate:** Do you want the student to independently request “more” at snack time/meal time, participate in song/music class, appropriately answer questions in science class, participate in “social conversation” at recess time?
- **Participate in Academic Tasks/Environments:** Do you want the student to complete paper/pencil tasks independently or comprehend key concepts in lessons?
- **Be Organized:** Do you want the student to be able to initiate assignments, turn in work on time, keep personal areas neat and organized, and know where his/her belongings are?
- **Navigate Within the Environment:** Do you want the student to walk down the halls unassisted, get on/off a swing, slide, etc. independently?
- **Behave within Expected Parameters:** Do you want the student to stand in line appropriately, use the restroom appropriately or tolerate an unplanned fire drill without incident?
- **Interact Socially:** Do you want the student to participate in group games using appropriate language or greet peers in hall without a prompt?
- **Transition:** Do you want the student to use an activity schedule to complete an activity independently, tolerate the termination of activities, accept changes in schedule, etc.?

SOLUTION GENERATION TOOLS: Determine tools and strategies including assistive technology where appropriate for each area. Possible ideas are given in parentheses as stimuli, but utilize the team’s group knowledge to determine tools specific to your student’s needs. This part of the process involves brainstorming where every suggestion is written down without discussion.

- **Sensory** (sensory diet, physical exercise, self-regulation)
- **Motor** (visual cues, boundary indicators)
- **Communication** (sign/gestures, communication boards, choice boards, speech generating devices, topic cards, greeting cards)
- **Academic** (schedules, modified assignments, visual support strategies, notes given in advance, use of peer models, incorporate high interests, portable word processor)
- **Organization** (in/out boxes, special folders, color coding, visual support strategies, memory strategies, PDA, timers, schedulers, watch with calendars/timers)
- **Behavior** (social stories, visual cues, changes in proximity of adults, visual behavior management cards)
- **Social Interaction** (Social Stories, comic strip stories, role playing, visual cues, video taping, audio taping, social rule cards, peer models, social scripts)
- **Transitions** (object, picture, word schedules, visual auditory termination cues, visual/verbal reminders)

SOLUTION SELECTION: Discuss the list of solutions/tools generated, thinking about each one and how they may or may not help this student. Select the ones that you feel you can accomplish. Sometimes it helps to think about some things you can implement immediately, some that you can implement after you acquire or create needed materials, and finally things that you may want to try in the future.

- Indicate your selections by putting a check by them, circling them, or highlighting them.
- You may prioritize them with numbers or letters or group them into sequences.

IMPLEMENTATION PLAN: After you have selected the solutions that you wish to implement, you must develop a plan with specific names and timelines. Think about:

- Who will create the tools? By when?
- Who will share them with the rest of the staff (include bus drivers, physical education teachers, music teachers, principals, lunchroom staff, substitute staff, etc.)?
- Who will “train” the student to use this tool? When? Backup person?
- Who will “train” (or inform) the family about use of this tool? By when?
- Who will ensure the use of this tool? How and how often (chart?)?
- How will the team ascertain the success of these tools?

FOLLOW-UP PLAN: Set the date when you will meet again to review progress and make any needed changes in the Implementation Plan.

- When will this team meet again?
- Where will they meet?
- Who is responsible to schedule?

Section 4-
Assistive Technology
Tools and Strategies:
A Resource Guide

Assistive Technology Tools and Strategies: A Resource Guide

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A.T. Tools and Strategies for Students with Autism

This section was originally written by Susan Stokes, Autism Consultant, CESA #6, in 2000. This revised manual has retained most of Susan's original content, with some updates and additions.

Throughout the years, a large variety of strategies and tools, including technology, have been used to enhance both the functional capabilities and the quality of life of people with developmental disabilities. The varied use of these strategies and tools--especially those with the power of technology with individuals with autism spectrum disorder (ASD)--continues to receive limited attention in spite of the fact that technology tends to be a high interest area for many of these individuals. Frequently, consideration of assistive technology is limited to augmentative communication purposes; that is, as an alternative way for individuals with limited verbal expression (speech) to communicate. Although the use of augmentative communication can be significant for individuals with ASD, there are many other ways in which assistive technology may be used. This section will discuss how various tools and strategies, including no, low, mid, and high technology methods can be used with individuals with ASD. While our focus is on students, most of this information applies to adults as well. The needs of students from early childhood through high school and transition into postsecondary life are also addressed.

This section has been organized into ten sections that outline strategies and tools within each area. These areas are: Visual Representation Strategies, Sensory Input, Motor, Receptive Communication, Expressive Communication, Academics, Organization, Behavior, Social Interaction, and Transition. Within each section, strategies and tools have been categorized into the following:

No Tech Tools and Strategies: These include actions or environmental arrangements carried out by a staff person or by the individual with ASD—no tangible item or material is involved.

Low Tech Tools and Strategies: These require the student or staff person to utilize an item that typically is not electronic or battery-operated. They are usually lower-cost items and are relatively easy-to-use (e.g., dry erase boards, clip boards, 3-ring binders, photo albums, picture symbol cards, choice board with no voice output, highlighting tape, etc.).

Mid Tech Tools and Strategies: These include battery-operated devices or “simple” electronic devices (e.g., tape recorder, Language Master, overhead projector, timers, calculators, simple voice output devices, etc.).

High Tech Tools and Strategies: These involve the use of complex, typically higher-cost equipment as well as some training for effective use (e.g., video cameras, computer software, adaptive computer hardware, complex voice output devices, etc.).

All of these tools and strategies can be used to:

- Increase the student’s overall understanding of his or her environment
- Increase attention and motivation
- Improve organizational skills, social skills, and self help skills
- Allow the student to focus on the content of academic materials and tasks; and most importantly
- Increase independent functioning in all aspects of the student’s life, which typically results in an overall decrease in the occurrence of challenging behaviors

WHAT IS ASSISTIVE TECHNOLOGY?

According to the Technology-Related Assistance for Individuals with Disabilities Act of 1988 (Public Law 100-407), **assistive technology device** 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 functional capabilities** of individuals with disabilities. In IDEA 1997 and 2004 this definition remained unchanged. IDEA 2004 added an exception that states “The term does not include a medical device that is surgically implanted or the replacement of such device” (Public Law 108-446, 602 (1) (B)). **Assistive technology service** is any service that directly assists an individual with a disability in the selection, acquisition, or use of an assistive technology device. These definitions were incorporated into the Individuals with Disabilities Education Act (IDEA) in 1990 and remains today. In addition IDEA 2004 continued the requirement that “...each public agency shall ensure that assistive technology devices and assistive technology services are made available to a child with a disability if required...” (300.105 (a)). In this section, we refer to the entire continuum of low to high tech items as “assistive technology.”

VISUAL REPRESENTATION SYSTEMS



Typically we think of visual representation for increasing expressive communication. Experience has taught us that using visual representation at the individual's level of understanding also increases receptive communication. Visual supports can also enhance cognition and general information processing.

Because individuals with ASD typically process visual information with the greatest clarity, providing them with visual supports helps to promote that strength. Various types of technology—from “low” to “high” tech—should be infused into every aspect of their daily lives.

Regardless of the technology being used, it is crucial to determine which visual representation system is best understood by the individual. More importantly, we must determine in which contexts the visual representation system is best comprehended and utilized. **Visual representation systems** may include a variety of visual supports, such as **objects, photographs, realistic drawings, line drawings, and written words**. It is important to note that the chosen system should commensurate with the student’s level of comprehension. In addition, some students may need different modes of visual representation in different contexts or locations. This variation may depend upon the skill being taught, the number of distractions in the environment, and the specific characteristics of the individual with ASD. In order to make appropriate selections, one must know how the student responds to a variety of stimuli and what strategies the student may have already developed in the areas of attendance, organization, communication, and others. For example, a student may use real objects in a daily schedule because the real, tangible objects appear to provide a greater amount of information to help him understand and navigate throughout the day. The object schedule may also help to increase focus during periods of transition. However, this same student may use photographs or line drawings to engage in a picture exchange to communicate with another student. Some researchers suggest that some children have greater success when visual supports have been created using line drawings, such as the Mayer-Johnson Picture Communication Symbols (Peterson, 2000). If the student experiences significant difficulty comprehending this mode of representation, a more concrete representation, such as photographs, should be explored. If photographs are still not successful, the use of real objects (or parts of real objects) may be utilized.

Mayer-Johnson’s software, *Boardmaker*, is a user-friendly program that can be used to create picture communication symbols for a variety of purposes. Available for both Macintosh and Windows platforms, this program offers 3,000 picture communication symbols (PCS) in a library of both black/white and color picture symbols. Symbols can be created in any size and may be accompanied by any written word or phrase. They present a relatively clear, “uncluttered” representation of an item, action, or occurrence, and help to decrease the ambiguity that can often arise when using regular photographs. For example, Robert’s classroom teacher, Mrs. Scott, took photographs of the other teachers in Robert’s environment with the purpose of helping him learn their names. When reviewing the names of the teachers in the photographs Robert referred to one photograph of a particular teacher as “Mexico.” Upon further review of this photo, Mrs. Scott

realized that in the background, barely discernible to her, was the corner of a map. Although Mrs. Scott perceived the other teacher as the salient feature in the photo, Robert was processing the minimally visible map of Mexico as the most important detail, and labeling the photograph according to this feature.

When using line drawings, such as those produced with *Boardmaker*, attention should be given to determining whether to use black and white or color picture communication symbols. Some individuals with ASD exhibit a high preference or a strong aversion for specific colors. Therefore, if a colored picture communication symbol is used with a student who exhibits a high preference for a specific color, and that color happens to appear in a small part of that symbol, the individual may focus only on that high interest color and not process the entire picture. This makes the picture communication symbol virtually meaningless to the student. Given the symbol for “lunch” with a red apple as well as a brown sandwich and orange juice, Sally, who has a high preference for red may only process the apple. Another possibility is that Sally may not even process the image, but attend only to the color depicted. Therefore, the symbol may become non-meaningful to Sally. Black and white picture communication symbols tend to circumvent any ambiguity related to color. It is important to experiment with black and white and color in order to determine what effect color has on a given student.

In addition, using a protective laminating material that produces a high gloss on picture symbols may interfere with an individual’s comprehension and attention to the symbol. Experimentation will reveal whether or not the individual with ASD seems to be affected by materials that produce a glare.

If the individual has difficulty understanding the picture communication symbol line drawings and needs a more concrete representation, *Picture This* (Silver Lining Multimedia) is a software program which allows for the presentation of real photos without the ambiguous background clutter sometimes encountered with photographs. *Picture This* contains over 2,700 photos from various categories and are ideal for creating daily schedules, activity schedules, augmentative communication systems, games, materials for reading activities, materials for sequencing activities to teach following directions, and other visual supports.

For students who have difficulty understanding a two-dimensional visual representation system such as photos or drawings, Bloomfield (2000) suggests using **True Object Based Icons** (TOBI). TOBI are line drawings or photographs that are cut out in the actual shape or outline of the items they represent. Providing the object shape which the student can both see and feel, appears to assist in understanding a two dimensional representational system. TOBI tend to be somewhat larger than typical symbol systems, and when initially introduced, may be three inches or larger. The printed word should also accompany the picture and should be strategically placed so as not to alter the symbol shape (Bloomfield, 2000).

For those students making that transition from using a visual representation system of objects or photographs to black/white line drawings, a simple strategy of placing a small black/white picture communication symbol in the corner of the various objects/ photographs currently used may facilitate this process. Gradually increase the size of the picture communication symbol

until it covers up more and more of the photograph or object. This strategy has proven very successful with many students in teaching them to understand and use symbols.

It is important to note that, regardless of the visual representation system being used, a written word should almost *always* be presented with the visual representation system. Many individuals with ASD exhibit a high interest in letters and words, and some are very early readers and writers. It is a good idea, therefore, to provide printed letters, words, and/or phrases with any picture or object presented to the student in order to promote emerging literacy.

Each student is an individual. Standard protocols for the order of introduction of symbols and visual representation systems are generally applicable, but responding to the individual needs and preferences of students is a top priority in developing a system that will be successful. Gather data and meet as a team to create visuals/icons that reflect the student's current educational, cognitive, and functional levels. Give a well-developed system every opportunity to work, but be willing to adapt as changes become necessary.

The remainder of this section will outline various suggestions for people living and working with students with ASD must take into consideration. Various assistive technology tools and strategies that may assist in these areas are discussed within each category.

SENSORY INPUT

The sensory area is one that is sometimes neglected or undervalued. Educators and parents may see behaviors such as “tackling” a teacher during story time. People may recognize this behavior only as being inappropriate and disruptive. However, underlying that behavior may be a need for sensory input such as movement or firm pressure. Some students may be unable to manage uncomfortable environmental factors, such as sitting on a scratchy rug or hearing the hum of a computer. A daily sensory diet consists of various sensory calming or arousing activities that are scheduled throughout the student’s day. This can decrease stress, anxiety and repetitive behaviors as well as increase calm, relaxed states and focused attention.



The sensory diet, a term coined by OT Patricia Wilbarger, is a carefully designed, personalized activity schedule that provides the sensory input a person's nervous system needs to stay focused and organized throughout the day.

<http://www.sensorysmarts.com/diet.html>

<http://www.iidc.indiana.edu/irca/sensory/sensoryintegrate.html>

Sensory Input: No Tech Tools and Strategies

Many strategies are available to help individuals with ASD reduce potential problems with sensory issues in the classroom or work setting. Here are a few ideas. See the References and Resources section for additional ideas.

Visual

Visual Stimulation: It is vital for educators to be aware of mobiles and art projects that hang from the ceiling and the clutter of pictures, words, and designs within the classroom. These visual items, that others think may enhance the environment, distract many students with ASD. Some individuals are highly distracted by colorful rugs or mats, and are not able to effectively attend to a story or directions when this highly distracting item is present. Careful observation of what types of visual stimulation exist within the classroom or work setting may help staff to make adaptations. Mr. Jones found success by removing colorful items in **one** part of the room, leaving neutral colors and bare walls. Once done, the students with ASD tended to naturally gravitate toward that part of the room when they were beginning to become over-stimulated. He also noted that some “typical” students drifted towards the more “peaceful” part of the classroom when noise levels rose and during later in the school day. Much can be discerned about over stimulation by watching where students CHOOSE to go at various times of the day.

Auditory

Staff Voice Volume/Tone: Noting and attempting to vary the voice quality used by the staff (e.g., reducing the tension and volume; using soft, easy speech) may calm students prone to tantrum at stressful times of the day. Observing the students’ reaction to various staff members

may also reveal that one person's voice is more disturbing than the others, simply because of pitch, volume, or rate.

Multisensory

Staff placement: Staff may want to experiment with proximity to the student with ASD. Some students with ASD are negatively affected by the close proximity of a teacher, paraprofessional, or another student. While other students may seek this "hovering" and find it supportive, the individual with ASD may need more space to maintain focus and comfort. For some students, challenging behaviors are known to decrease when staff members recognize and respect this need.

Vestibular

Stretch breaks: Many students with ASD (as well as "typical" students) tend to work more efficiently and effectively given frequent stretch breaks or the liberty to get up and move about the room when necessary. Another variation of this is to have materials necessary for a specific activity located across the room, so the student must get up and move in order to obtain the necessary materials.

Sensory Input: Low Tech Tools and Strategies

Oral

Allow gum or water: Some individuals with ASD may frequently make noises or engage in "self-talk" which annoy others. A strategy that may help is to allow the student to chew gum or to keep a sports bottle with water close at hand to provide self-regulating oral stimulation in a more socially appropriate manner.

Chewy: Some students also benefit from having devices to chew on as a way to give themselves the oral stimulation they need. <http://www.affordabletherapysolutions.com> or <http://www.beyondplay.com> both have oral motor chewies, under oral motor in the menus.

Proprioceptive

Being Rolled in a Mat: Some individuals with ASD that seek deep pressure may find comfort in being rolled up in a mat, provided firm pressure with pillows, or being given a firm "bear" hug. An occupational therapist with training in sensory integration can help determine if and when this might be helpful.

Weighted Vest: Some occupational therapists find that using a weighted vest or weighted blanket for short periods helps to calm an individual with ASD and will allow the student to sustain focus on tasks during and after wearing the weighted item. It is important to note that consultation with an occupational therapist is essential for determining initial use of these tools. If the weighted item is worn for too long, habituation may occur, decreasing the effectiveness of this tool.

Vestibular

Alternative Seating Choices: Provision of a variety of chairs (bean bag chairs, chairs with springs, cube chairs, etc.) may help a student with ASD to maintain focus for a longer period of time. Changing to a different type, feel, height, or width of chair may provide a different sensory input that helps the individual remain on task. Inflatable seat cushions (like the Disc-o-sit) can provide some "motion" to help a student sit in a typical seat.

Therapy Balls and Swings: The use of therapy balls as an alternative seating choice has shown to be an effective means of maintaining attention and focus for some students with ASD. Allowing students to "sit" on a therapy ball while working on a task or listening to teacher direction provides the student with some movement opportunities and stability to the legs and feet by maintaining balance as they sit. Swinging for periods of time between activities has also proved to be effective for some individuals who benefit from vestibular stimulation.

Multi-Sensory

Break Card: Some individuals with ASD may find benefit from being able to determine when they are over stimulated and need a short break. Having access to "I need a break" symbols that the student chooses at the appropriate times may prevent challenging behaviors and may give the student a greater feeling of independence. When these cards are introduced, the activity taking place immediately after the "break" should be a highly motivating one, so these "breaks" are not overused.

Self-Regulation visual representation: Some children benefit from the use of a visual representation like a thermometer or car engine to represent their arousal system. Giving them words and a picture to describe how they feel can be very beneficial for children to prevent complete over-arousal or shutdown. A great program is "*How Does Your Engine Run? The Alert Program for Self-Regulation*", by Mary Sue Williams and Sherry Shellenberger.
<http://www.alertprogram.com/about.php>

Visual

Covering Brightly Colored Objects with Neutral Color: Being aware of visual stimulation and how it may affect the individual with ASD is an ongoing challenge. Brightly colored rugs, wall hangings, or other items may be interfering with the student's ability to attend. If so, try covering the item with another item of a more neutral color. For example, Michael, a young child with ASD, was suddenly very distracted during story time and could not stay in his assigned place. After a short time, he began having a tantrum. The classroom staff could not determine that any changes had occurred in Michael's programming, home situation, peer relationships, nor were there any differences in staff within the classroom. Sharon, the paraprofessional then noted that a bright red-colored carpet square had been recently added to the collection of more neutral-colored squares. Because the child who typically sat on that square was absent that day, that square was on the very top of the pile, right next to the teacher reading the story. Placement of the red carpet square underneath the others quickly calmed Michael and story time was able to continue peacefully.

Lighting: Florescent lighting is the most common lighting used in classrooms and may affect behavior. Many adults with autism report that florescent lights bothered them greatly during their

school years. In addition, UCLA researchers observed more repetitive, self-stimulatory behaviors under florescent lighting compared to incandescent lighting. Teachers may want to turn off the florescent lighting in their classroom for a few days to see if there is a decrease in behavioral problems for some or all of the students. During this trial period, the teacher can use natural light from the windows and/or incandescent lights. Scotopic Sensitivity Syndrome (SSS) encompasses more than sensitivity to fluorescent lighting, including poor reading, trouble tracking, slow reading rate, eyestrain, fatigue, and poor depth perception. Colored overlays may help in the reading area. For more information on Scotopic Sensitivity see <http://www.hale.ndo.co.uk/scotopic/>. See <http://irlen.com/index.php> for more information on colored overlays.

Tactile

Providing Tactile Input: For the child who is hyposensitive to touch, the use of Skishies, Koosh balls, strips of the hook side of Velcro, and other tactile materials may help provide needed tactile input.

Sensory Input: Mid Tech Tools and Strategies

Multi-Sensory

Choice Board of Sensory Activities with Voice Output: As students with ASD become older and more familiar with the adaptations they must make to maintain attention and focus, they may benefit from having access to a choice board of sensory activities during a “break” time. Often, individuals will choose the activity that will provide them with the type of input they require. If the individual is not able to use verbal language to communicate these choices, use of a simple voice output device can be very beneficial in providing both the student and the staff member both visual and auditory feedback of the choice that has been made. For a student who seeks more movement, activities might include: riding a stationary bicycle, playing with a yo-yo, playing a fast moving computer game, dancing to music, or other activities which provide vestibular stimulation.

Sensory Input: High Tech Tools and Strategies

Visual

Computer games and software programs: Some individuals with ASD find sensory regulation in various computer software programs. Programs or games that are highly visually stimulating and have a relatively fast pace are often favorites for some individuals with ASD. For others, programs that are accompanied by music or other auditory stimuli are sought. Although not always appropriate in all environments, video game systems are often a popular recreation choice for individuals with ASD because of their rapid pace and high stimulation levels.

MOTOR

Motor Skills: Terms that often describe poor motor skill development for children on the autism spectrum are dyspraxia (difficulty with motor planning) and dysgraphia (difficulty with handwriting).

Symptoms of dyspraxia: Coordination difficulties can be particularly problematic in physical education classes and other sports activities. Speech difficulties can interfere with casual conversation, which can result in social awkwardness and unwillingness to risk engaging in conversation. It also presents in writing difficulties such as poor letter formation, pencil grip and slow writing, which can impact completing school work tasks.

Symptoms of dysgraphia: A mixture of upper/lower case letters, irregular letter sizes and shapes, unfinished letters, struggle to use writing as a communications tool, odd writing grip, many spelling mistakes (sometimes), pain when writing, decreased or increased speed of writing and copying, talks to self while writing, muscle spasms in the arm and shoulder (sometimes in the rest of the body), inability to flex (sometimes move) the arm (creating an L-like shape), and general illegibility. Reluctance or refusal to complete writing tasks is often mistaken as lack of motivation, or worse, laziness.

Students with dysgraphia often have sequencing problems. Studies indicate that what usually appears to be a perceptual problem (reversing letters/numbers, writing words backwards, writing letters out of order, and very sloppy handwriting) usually seems to be directly related to sequential/rational information processing. These students often have difficulty with the sequence of letters and words as they write. As a result, the student either needs to slow down in order to write accurately, or experiences extreme difficulty with the "mechanics" of writing (spelling, punctuation, etc.). Students with dysgraphia also tend to interchange letters and numbers in formulas. Usually, they have difficulty even when they do their work more slowly. By slowing down or getting "stuck" with the details of writing, students may lose the "train of thought" that they are trying to write about.

Some students with ASD can also experience writing difficulty because of challenges with auditory or language processing. Because of their difficulty learning and understanding language in general, they obviously have difficulty with language expression. Remember that written language is the most difficult form of language expression.

Motor: No Tech Tools and Strategies

Modeling by the teacher or peers: This is especially helpful with new physical education activities or games. If only verbal directions are given, the student with ASD may miss important steps while trying to process the auditory information or be so distracted by the sound that he misses important directions.

Teach abbreviations for writing notes (such as b/c for because). Have the student develop a repertoire of abbreviations in a notebook. Provide these on a sheet at the student's desk.

Self-Talk: Encourage student to talk aloud as they write. This may provide valuable auditory feedback.

Scribe: Allow the student to dictate some assignments or tests (or parts thereof) to a 'scribe'. Train the 'scribe' to write what the student says verbatim and then allow the student to make changes, without assistance from the scribe. This is good for younger children but work towards more independence using computers and software for additional support. Scribing should not be an accommodation for a child in middle and high school.

Motor: Low Tech Tools and Strategies

Boundaries: Because some individuals with ASD have trouble manipulating large spaces, it may be beneficial to have areas of the classroom or work site clearly designated. For example, a line may be made on the floor with tape around the teacher's desk, indicating that space is "off limits." Some individuals tend to follow lines or cracks in the walls or on the floor. Being aware of such environmental cues and using them to best help the individual function independently may provide better understanding of the individual with ASD. Because of the potential for distraction or disruption by color, the borders should be denoted with neutral colors such as plain masking tape.

Boundaries for Writing: Drawing boxes to put their letters on the answer line helps students to know where and how big to write. Using lines instead of boxes can be too ambiguous for some students. Boxes can be easily drawn on worksheets or workbooks until the student is able to modulate the sizing better.

Writing Utensils: Research indicates that using a variety of writing tools encourages students to choose what works best for them. Preferences could include: markers that provide more color with less pressure; wider diameter markers or pencils that give a larger surface to grasp; narrower diameter markers or pencils that provide less contact with the writing tool; or soft lead pencils that give more drag on the writing surface and provide more sensory feedback.

Writing Utensil Grips: There are a variety of grips that can be added to writing utensils to encourage an efficient grasp. Having a variety of grips for students to try helps them to be a part of deciding what works the best for them.

Writing Paper: Writing paper can make a difference for students. Raised line writing paper gives tactile feedback about where the lines are. Using graph paper for placement of individual letters or to keep numbers aligned is also helpful. Paper that has a higher bond (greater than 20 pound bond) does not easily rip when it is erased and can decrease frustration.

Alternate Writing Surfaces: Using sand or shaving cream on a cookie sheet, Magna Doodle or other alternative method to practice writing may also increase the willingness of the student to practice letter formation.

Alternate Handwriting Instruction: Using high interest Boardmaker pictures as the stopping and starting points for letters can be a way to engage students in wanting to learn to form letters. Allowing the student to choose the pictures makes it meaningful to them and may help engage them so they will want to practice.

Acrylic Easel: Imitating, following, and tracing can be very difficult for many young children with ASD. The acrylic easel is designed to address this difficulty. An adult can put their hand inside the easel and make motions or marks for the child to follow. Because the easel is transparent, the child can see the movement and the adult can easily monitor the child's response.

Picture Cards: Picture cards with the expected sequence of movements or actions can be especially helpful in understanding complex motor activities.

Motor: Mid Tech Tools and Strategies

Tape Recorder/Recording Device: Have students dictate their ideas into a tape recorder and then listen and write them down later.

Keyboarding: Use an Alphasmart, Neo, The Writer or Fusion to practice keyboarding skills.

Label Makers: Many students who are not able to form the letters, but are at a level in which they are required to or want to write, can use electronic label makers to type in answers and print, peel and stick them to worksheets, workbooks, etc. Label makers come in a variety of sizes with a variety of features including size of keys, memory, different fonts, font sizes, tape sizes, and automatic or manual cutting.

Portable Word Processors (instead of keyboarding): Use the Alphasmart, Dana, Neo, CalcuScribe, Writer or Fusion not only to practice keyboarding but to take notes or complete written assignments.

Motor: High Tech Tools and Strategies

Some students with ASD who have significant physical difficulties may need higher tech tools to function independently within their environment. It is not the purpose of this section to go into devices for individuals with physical disabilities. Consultation with an occupational and/or physical therapist is recommended for the exploration of alternatives in this area.

However, computers can be used to allow a student to learn and practice concepts even though motor skills or verbal skills are delayed.

- Use auto correct options for decreasing keystrokes.
- Scan a worksheet so the student can complete on the computer. If the student does not need the computer to read to the student any scanner with Paperport software is a good choice. As of 2004 Paperport does not support Mac.

- On a computer, the student can produce a rough draft, copy it, and then revise the copy, so that both the rough draft and final product can be evaluated without extra typing.
- Write:Outloud/Co:Writer and Word Q have a talking word processor and word prediction for spelling support. It may be difficult at first, but after they have learned the pattern of the keys, typing will be faster and clearer than handwriting.
- For students where dictation is a good alternative, try voice recognition. Voice recognition is in the Vista operating system. If you are running Windows XP you need to use Microsoft Office 2000 or 2003.
- See Academics for more supportive writing software for composing written material.

RECEPTIVE COMMUNICATION

Receptive Communication: No Tech Tools and Strategies

Slowing down the rate of your speech, speaking more softly, or significantly pausing before repeating a direction or request may help the student with ASD respond appropriately. As adults, we often repeat a direction or request if there is no response after a pause as short as one second. Waiting 5-10 seconds can give the student with ASD a chance to process the request and formulate a response.



To some individuals with ASD, language processing can be like laundry in a clothes dryer. If Mom says, “Hang up your coat, Billy” and Billy doesn’t comply, she is likely to say it again, perhaps a bit louder or with more inflection. For some individuals with ASD (and many other individuals with language processing issues), the bombardment of language is like overloading your clothes dryer. By giving one short, simple direction at a time and then pausing (3-5-10 seconds), that pause gives the “laundry” (the direction) time to “dry” (be processed) and then “put away” (stored) in a place that will be retrievable later.

In addition to being given appropriate processing time, students with ASD need to have a method for communicating what they want and the tools to interact with others appropriately. Jason, a nine-year old student with ASD was having a difficult time in the lunch line. He frequently had a tantrum and had to be removed from the cafeteria. Mrs. Morris, his teacher, observed that this seemed to be related to receiving food on his lunch tray that he did not want. The servers expected students to tell them what they wanted or did not want and when he did not tell them, they simply gave him some of everything. Mrs. Morris taught Jason to point to foods he wanted and taught the servers to ask, “What do you need to tell me?” and then WAIT. Sometimes it took 20-30 seconds for him to respond. Because they understood the need to wait, they were patient. Jason began to get the food he wanted and all tantrums stopped. After practicing for several weeks, Mrs. Morris was able to cue the servers to only use the prompt if he didn’t indicate the food he wanted. Jason can now go through the lunch line independently.

Receptive Communication: Low Tech Tools and Strategies

A variety of “low” tech strategies can be used to increase an individual’s understanding of his or her environment and the expectations surrounding that environment. Many skill areas can be addressed through a focus on increasing receptive communication and comprehension skills. Organization, attending, self-help, following directions, following rules, modifying behavior and most importantly, increasing levels of independence can all be achieved through a more productive focus on receptive communication. Once a successful mode of visual representation is determined within a specific context, the following strategies can then be utilized to provide the student with greater information, thus increasing his or her comprehension of the world. Consequently, the occurrence of challenging behaviors will markedly decrease.

Schedules: Consistent daily use of an individual visual schedule may help to increase a student’s organizational skills and independent functioning. Schedules can be used as daily schedules, which outline the activities of the entire day. Specific **activity schedules** can also be created to assist an individual through a particularly abstract or challenging activity. Each activity schedule is on a separate card or piece of paper and addresses only the specific steps of that activity.

There are a variety of methods to present visual schedules (e.g. object schedule, picture symbols in three ring binders, picture schedules on clipboards or magnetic folders, schedules on file folder, dry erase boards, etc.). The unique needs of the individual who will be using the schedule should be considered in its design.

Schedules are equally important in environments outside of the school environment. Schedules in the home, in a day care situation, at a work site, and other environments in which the student will spend large quantities of time are essential. The information provided visually through the schedule is critical in helping the student to understand what will be happening during that day or time period and in what sequence the activities will occur.

A visual daily schedule will provide the student with the following information:

1. What event/activity is occurring in the present
2. What activity/situation will be occurring next
3. How many activities there are in a given time period
4. An alert to any modifications in the typical routine that may occur

A visual schedule is a “first-then” strategy; that is, “**first** you do ____, **then** you do ____”... It is important for the student to indicate that he or she has completed a scheduled activity, for example, by crossing out or checking off the scheduled item, or by placing the scheduled activity object/photo/PCS in a “finished” envelope. A visual schedule is important because the student can “check” it as many times as he or she needs to feel reassured about what is happening during the day.

A variety of social interactions may be included into the individual’s daily schedule (e.g. showing completed work to a teacher for social reinforcement), as well as building in a balance of “high stress” (non-preferred) and “low stress” (preferred) activities. “Break time” or “quiet time” can also be visually scheduled at various times throughout the day as needed for the individual student.

Mini-schedules: Mini-schedules or activity schedules can also be incorporated as needed into any aspect of the student’s day. For example, a mini-schedule of the activities to take place in speech/language therapy could be developed and used in the same manner as the student’s daily visual schedule. A visual routine checklist titled “Before Kindergarten” was developed for Michelle who was having difficulty establishing a routine while waiting to go to kindergarten after lunch. This lack of routine typically resulted in challenging behavior because she did not understand what was expected of her during this time period. The mini-schedule was laminated and posted on the refrigerator with magnets. Michelle would then check off each completed activity: eat lunch; wash face and hands; brush teeth; read two books; put on shoes and socks; put on coat and backpack; wait by the door for the bus. The visual schedule allowed her to

remind herself as many times as needed exactly which tasks needed to be done and which ones she had completed. It calmed and reassured her and the challenging behaviors stopped.

Activity Schedules: For some students with ASD, learning to **independently** engage in appropriate tasks/activities for a given period of time is a paramount life skill. An activity schedule provides additional visual support via words or pictures (either photographs or picture communication symbols.) These visual supports help to cue the individual to engage in a sequence of steps in an activity. Activity schedules can be especially beneficial for the individual to develop **independent** recreation/leisure time skills. The number of activities and sequence of steps per activity will need to be determined based on the individual. Some students may need activities to be broken down and depicted in a “step-by-step” process to be fully comprehended with total independence. Other students may be able to utilize a more general, single photo/PCS/written word to cue them to perform an entire task or activity. Any type of binder (e.g., three ring binders, photo albums, etc.) can be used as the activity schedule book. For a student who reads well, a simple written list may be sufficient. The activity schedule book may contain the various tasks/activities (and steps if needed), depicted in the visual representation system the user best comprehends (e.g., photos, TOBI, line drawings, etc). Upon completion, a social reinforcement can be “built in” as the last page in the activity schedule book. For example, Jeff, a young child, uses a photo album with a photograph of a puzzle on the first page. On the next page, there is a photo of a shape sorter. On the third page, there is a photo of Jeff being thrown up in the air by Daddy. Sarah, a high school student, uses a written list each day when she gets home from school. A typical day might have the following items. Each is crossed off when completed:

1. Unload dishwasher
2. Vacuum living room
3. Fold towels
4. Use computer for 30 minutes

Calendars (home/school): Use of a weekly/monthly **calendar** at both home and school can provide the student with important information regarding coming events/activities, rather than relying on auditory information. Any time a student asks when a particular event will occur, he or she can easily be referred to the visual calendar (e.g., class field trips, “No School Day”, lunch at McDonald's, etc.). Calendars can also be used in another way to give the student important information regarding when he will be attending school and when he will be at home, which is particularly helpful for “days off” from school during the typical school week. A regular monthly calendar is used. Draw a little “school” on each day that the student will be at school and a little “house” on each day that the student will be at home. Many parents put these monthly calendars on the refrigerator and reference them daily with their child by crossing off a completed day and noting where he or she will be going (or staying) tomorrow.

Use of a visual calendar can also be helpful in assisting the individual in understanding when regularly scheduled events may not occur.

Universal “No”: Use of the universal “no” symbol (red circle with a line drawn through it) has proven to be effective in visually communicating the very abstract concept of “no” for

individuals with ASD. Use of the universal “no” symbol can assist the individual in visually comprehending the following:

“Stop - don’t do what you are doing”: (e.g., to communicate “no hitting” by placing the universal “no” over a picture communication symbol of “hit”).

“That is not a choice right now”: (e.g., if student hands another person a PCS of a desired item or activity that is not an option at that particular time, a red dry erase marker can be used to place a universal “no” on the PCS to indicate, “no _____, not now”).

“You are not permitted”: (e.g., placement of a large universal “no” on doors has been shown to stop some students from running out of the door).

“Nonexistence”: (e.g. placement of the universal “no” on a scheduled activity to acknowledge that, although the activity typically occurs at this time/day, it will not be occurring today).

For example, James has swim lessons every Friday after school, but this Friday the pool is closed. His teacher placed a universal “no” symbol on the scheduled swim lesson. This acknowledged that James typically does have swimming on this day; however a change is occurring for this particular day.

Lightning bolt/Change symbol: Just as the universal “no” symbol is used to indicate that something is not going to happen, a lightning bolt can be used to indicate that something new or unusual is going to happen (e.g., an assembly, a field trip, etc.). Place the lightning bolt next to the new event on the daily schedule.

Directions: Low-tech strategies can be used in many ways to give the student visual information for following directions. These strategies may increase the student’s comprehension of what is expected of him or her when compared with following only auditory directions. Visual directions help to gain, maintain, and refocus an individual’s attention as well as to help ensure that he or she understands complete instructions that will thereby reduce the amount of support needed. The following “low tech” strategies can be used to give the student visually presented directions:

Use of a dry erase board or white board: Memo Board Contact Paper (typically available where Contact Paper is sold or from Beacon Ridge) can be used to cover part of a notebook or schedule system that can then be used to write/draw various visual directions as they are given auditorally (e.g., take out your journals; write three sentences about your weekend; raise your hand when you are finished).

Sequential step directions for specific tasks/activities (e.g., brushing teeth, making lunch, vacuuming, folding towels, setting the table, checking out books from the library, cooking, “Homework Directions”, “School Morning Directions”, etc.) can be useful in allowing the student with ASD to better comprehend the task.

1. School “morning directions” card example: upon arrival at school, Chris is given a “morning directions” card to assist her in completing a visual list of instructions prior to sitting at her desk and beginning the day. The card is laminated and a wet-erase marker (water color markers for overhead transparencies work best) is attached by a string. These directions are located by Chris’s coat hook so that after hanging up her coat and backpack, she can take the card and begin the “morning directions.” Chris checks off each item upon completion (e.g., put reading book in tub; put attendance stick in box; put lunch ticket in hot/cold box; put “morning directions” card away; sit at desk).
2. Brushing teeth example: Picture Communication Symbols (PCS) representing each sequential step in this task are placed on a Velcro strip positioned directly above the sink (in front of the student). As the individual completes each step of the task, he or she pulls off the PCS representing the step that has been completed and places it in an “all done” envelope.
3. Library example: A small set of PCS representing the steps necessary to complete the library routine are gathered. Symbols include choosing a book, “checking” the book out, sitting at a table and reading the book, and then walking back to class. These symbols are attached to a metal ring, which can easily be kept in the student’s pocket or attached to a belt loop or binder for easy step-by-step reference when going to the library.
4. Setting table example: Photographs of each sequential step for setting the table are placed in a small photo album, accompanied by the written direction. The last page should indicate something desirable for the individual to do upon completion of this task, such as playing with the Koosh ball for two minutes. The student is taught to turn each page as he or she has completed each step.

Activity Termination Signals: For individuals who need very explicit **forewarnings** regarding when an activity will stop or end, the use of “go”, “almost done” and “stop” cards have proven to be effective in giving the individual this important information. These cards are particularly useful for activities that do not have clear endings, such as some computer games, video games, drawing, etc. Each card is a large colored circle with “go” as green, “almost done” as yellow, and “stop” as red, with the written word printed in large letters in the center of the colored circle. When the student begins an activity, the “go” card is placed on his desk or at the computer table and is accompanied by a verbal message to “go” or “start.” When there are approximately 1-2 minutes left of the activity, the “almost done” yellow circle is placed in front of the student, again accompanied by a verbal message. When it is time to terminate the activity, the “stop” circle is placed in front of the student with the verbal message indicating that it is time to stop.

Receptive Communication: Mid Tech Tools and Strategies

One-Message Speech Generating Devices: One-message devices, such as the Keychain Talker and Picture Frame Talker by Attainment, the One-Step Communicator and the BIGmack from AbleNet, and the Portable Talking ID and the Clip Talk from Enabling Devices/Toys for Special Children, are an easy and inexpensive way to provide receptive language input. Mounting a one-message device by the classroom door, programming it with “time to line up” and placing the appropriate picture symbol (photo or object paired with the text of “line up”) on it and prompting the student to activate it when it’s time to line up will help to teach the student the meaning of the message as well as the photo/symbol/word combination.

Multiple-Message Speech generating devices: Devices such as the Cheap Talk 4 from Enabling Devices/Toys for Special Children, Talking Photo Album from Augmentative Communication, Inc., the Mini Message Mate from Words +, The Tech/Four from AMDi, and the Four Frame talker from Attainment are some of many examples of devices that have multiple potential uses with individuals with ASD. For example, these devices can be programmed for one to four step directions. The individual presses the buttons and thus completes the sequence of steps. For example, Matthew experienced great difficulty following the sequence of three steps to complete his “job” to prepare for snack time. He required continuous verbal and physical prompting from an adult to attend to the task, as Matthew typically ran around the room. The three steps of the task were recorded on the Cheap Talk with the fourth message telling the child to “sit in chair.” An appropriate visual representation system, corresponding with each verbal message, was placed on top of each “button” on the Cheap Talk with Velcro. Because Matthew was extremely motivated to “push the buttons” on this device, he was then able to independently do his “job” at snack time.

The VoicePod is an inexpensive digital recording and playback system ideal for photos, language cards and communication symbols. It has 36 reusable, two-sided sleeves, each with an ID strip to access recordings, giving you up to 72 messages.



Language Master: The Language Master from EIKI International is a “mid” tech piece of equipment that has been used for more than 20 years. The Language Master is an electronic device about the size of a tape recorder. Cards that are approximately 3” x 8” with a recordable strip across the bottom are played “through” the Language Master. A short message can be recorded on the cards which are also big enough for a corresponding visual representation (e.g. written, PCS, photo) of the recorded message. The Language Master can also be used to help the student remember auditory directions, so check your shelves and closets to see if you can find new ways to use this “older” piece of equipment.

Receptive Communication: High Tech Tools and Strategies

Videotaping: Videotaping is highly interesting and motivating to many individuals with ASD. Because of this, they are often very attentive to videotapes. Many individuals with ASD seem to enjoy repetitive viewing of videos due to the “predictability” of the information given; that is, knowing what’s coming up next. The use of this medium, therefore, can serve as an excellent tool to teach a variety of skills to students with ASD who show a particular interest in this piece of technology.

Many receptive vocabulary skills can be taught via videotaping (e.g., learning the names of common everyday objects, toys, names of familiar people, animals, etc.). In addition, directions to complete various routines can also be taught through videotaping (e.g., making the bed, setting the table, getting dressed, going to the library, etc.).

Computer software: There are hundreds of software programs that can assist students with ASD with receptive language skills. IntelliTools *Classroom Suite*, for example, includes both auditory and visual support, as well as quizzes using a cloze format, which might appeal to students who benefit from structured tasks. Use of picture-supported texts and directions written using picture symbols (as in Slater Software’s *Picture It*, Crick Software’s *Clicker 5*, Mayer-Johnson’s *Boardmaker* or *Communicate: SymWriter*) or photos (from *Picture This* from Silver Lining Multimedia) can increase receptive language skills in addition to literacy and expressive language skills. Different software will appeal to different students. Exploring them can help determine which ones are appealing and also teach the desired concepts.

EXPRESSIVE COMMUNICATION SKILLS

Expressive Communication: No Tech Tools and Strategies

Pausing: In addition to utilizing pausing as a receptive communication skill, we must also be cognizant of how our communication strategies affect students with ASD. One of the most important strategies that educators and parents can use to increase expressive communication and especially the initiation of expressive communication is the “pause”. Pausing gives the student more time to understand that it is his or her turn to communicate, to process what may have been asked, and to formulate a message.

Expressive Communication: Low Tech Tools and Strategies

“Low” tech strategies are designed to focus on an individual’s expressive communication skills, and include the following:



Tangible Symbol Systems

<http://www.designtolearn.com>

Tangible Symbols have proved useful for a wide variety of individuals of all ages. Tangible Symbols Systems™ is not just a mode of communication, but a systematic instructional sequence. Here is an example of this system’s use:

Alberto, who had a diagnosis of autism, had usable vision but was very dependent on tactile information, he would use his fingers and mouth before experimenting with anything. A tangible symbol system was created for him, which combined three-dimensional and two-dimensional information in each symbol. His system of photos with small three-dimensional elements attached allowed him to request things he desired throughout his day. Later on Alberto began to develop speech, but he still needed his tangible symbol system. As he was encouraged to use his speech more, his need for tangible symbols declined. Eventually he began to use speech as his primary means of communication.

Picture point communication board system: The student points to various visual representations (e.g., photos, PCS, objects, etc.) located on a communication “board” in order to communicate wants, needs, comments, choices, etc. Many communication boards can be created, which are both context-specific and individual-specific (e.g., a place mat communication board to be used during snack and meals, with PCS surrounding the perimeter of the place mat; a communication board created for the “play” area, etc.).

Picture Exchange Communication System (PECS):

A wide variety of adaptations may be made when using a PECS program to meet the specific student’s individual needs. For example, some students find it useful to place the visual representation system on a frozen juice can lid or another hard material, such as a small rectangular sample of countertop material. In this example, the visual representation system becomes more salient to the student by giving him or her more tactile input (weight and hardness). This also increases the durability and functionality of the visual representation symbol for students who tend to “crumple” up lightweight paper type items in response to what may possibly be a sensory need.



PECS is a specific program that requires training and consistency for quality implementation. Often, the terms “PECS” and “picture symbols” are incorrectly interchanged. “Picture symbols” are the tools we use for expressive and receptive communication whereas “PECS” is a structured program that uses picture symbols. The student approaches and gives a visual representation (photo, PCS, object, etc.) of a desired item to a communication partner in exchange for that item (Frost & Bondy, 1996). Use of this type of communication system provides the student with a rapidly acquired communication system, and most importantly, teaches him or her to spontaneously initiate a functional communicative exchange.

Break cards: Also discussed in the Behavior section, “Time out” or “I need a break” cards can also be used by the student to communicate to another individual that a break is needed. Break cards should be easily accessible to the student and should be located in a consistent place in the classroom, work environment, day care, or home (e.g., on the student’s communication board or book, on the student’s desk, etc.). The purpose of the break card is for the individual to communicate the message that he or she needs a break via a more appropriate communicative mode (visual representation system), rather than having to become increasingly anxious and frustrated resulting in the appearance of challenging behaviors.

Choice cards: Choice cards (again using any type of visual representation system) allow the student a degree of independence by making a choice. Of course, the adult determines the choices presented to the student (e.g., a “work time” choice card can be presented to the student with several activities from which to choose). When presented in this manner, the individual may more readily participate in less desirable activities because he or she was allowed to make a “choice” regarding that specific activity.

“All done”/ “Finished” cards: Many individuals with ASD exhibit seemingly challenging behaviors to indicate that they are “all done” or “finished” with an activity. Typically, this tends

to be because they may not have a more appropriate way to communicate this concept. Teaching the student a more appropriate way to indicate “all done” via a visual representation system, therefore, may lessen both the student’s and the adult’s stress and frustration. “All done” or “finished” cards can be taped to the student’s work area and the appropriate use should be directly taught to the individual. First, terminate the activity prior to reaching the student’s attention/frustration level. Then, point to the “all done” card. The student’s hand can be physically prompted to point to the “all done” card if needed. “All done” cards can also be placed on the student’s communication board or book for them to readily access via a picture point or physical communication exchange.

Topic ring/topic wallet: This strategy is designed for individuals who are verbal, yet have difficulty initiating topics with others. It is also useful for those who have difficulty initiating a variety of topics with others; that is, not those just related to his or her areas of particularly high interest. The “topic wallet/ring” can have various topics visually depicted via written words, pictures, or PCS for the student to reference. For example, topics may be depicted individually on small 3” x 3” laminated cards using both PCS and written words. Then they can either be attached by a metal ring in the corner (for the student to hook on a belt loop) or, placed in a small “communication wallet” to be kept in his or her pocket. Topics might include: “What did you do over the weekend?” “What is your favorite movie?” “Do you have any pets?” “What books do you like to read?” The topics will initially need to be trained on an individual basis, followed by a small group setting. This will provide the student with practice using this visual support system. It can also provide ways to expand on the topics once they have been initiated. This strategy will help to ensure successful generalization of this system beyond the classroom setting.

Past event cards: A large number of individuals with ASD, both verbal and non-verbal, have significant difficulty relating past events. Using a visual representation system that the individual readily comprehends can help to bridge this gap, at least between home and school or the work place. Staff members can create generic templates that can be easily circled or filled out each day and sent to the respective location (home or school) to aid the individual in relating information about what occurred. For example, a card might say: Today, I: made my lunch, read a book on _____, saw a movie about _____, etc. Only the activities that actually occurred would be circled.

Expressive Communication: Mid Tech Tools and Strategies

Listed below are descriptions of a few “mid” tech devices that may be used to address various skill areas including expressive communication. Most of these devices are very appealing to students with ASD and, thus, provide them with motivation to successfully participate in various classroom activities.

Speech-generating devices (SGDs): Any type of visual representation system can be placed on simple speech-generating devices (devices) that students can easily access by a simple push of a “button.” Most of these devices are battery-operated and are easy to update with new messages. It is important to note that these devices were created to provide an augmentative means for

individuals to communicate. However, as noted above, many individuals with autism spectrum disorders find these devices to be motivating. Therefore, their use can expand beyond expressive communication and into use for practice in many different skill areas.

Suggestions for the following specific devices are being provided below. There are many other simple speech-generating devices not listed which can be used in the same manner as the devices mentioned. This is not an inclusive list.

One-Message Devices:

BIGmack-- Ablenet

Memo Talker—Attainment

One Message Hip Talk—Enabling Devices

Portable Talking ID—Enabling Devices

One-Step Communicator—Ablenet

Voice Recording Pen—Attainment

Talking picture frames (various types, from single message to 24 messages)

Multiple-Message Devices: (one level)

5 Talker—Attainment

Cheap Talk 4, 8—Enabling Devices

Communication Builder—Enabling Devices

Four Frame Talker—Attainment

Mini Message Mate—Words +

Talk Back III—Crestwood

Tech/Four—AMDi

Message Mate 20, 40—Words +

Devices with Levels:

Go:Talk—Attainment

Chat Box—Saltillo/Mayer-Johnson

32 Message Communicator—Enabling Devices

Mult-Level Message Mate 40—Words +

6, 12 Level Communicator—Enabling Devices

Step by Step Communicator with Levels—Ablenet

Tech/Speak (32)—AMDi

Devices must be accessible to individuals at all times, however, since initiation of communication can be challenging for some individuals with ASD. Mounting a single-message device near a block play area programmed for “let’s play blocks” encourages the student with ASD to initiate communication with a peer or adult. One-message devices can be programmed to assist the older student to ask for help, request a break, or comment on activities (e.g., “Awesome.”)

With appropriate and consistent modeling and training, individuals with ASD can express themselves through visual representation mode positioned on a “simple” speech-generating device. Many users are motivated to communicate with these devices, particularly because

auditory feedback is provided immediately upon their initiation of their communicative message. Use of speech generating devices have proven effective in teaching an individual the cause/effect of language through activities which are stimulating to them (e.g., use of the BIGmack for a individual to request highly desired sensory activities such as “chase me”, “tickle me”, “hug me”, “listen to music”).

However, the use of SGDs as communication devices is not always effective for all individuals with ASD. Some individuals find the devices so motivating and stimulating that they do not become effective communication devices. In this case the individual may repeatedly push down the button(s) on the device for the self-stimulation they receive from the auditory feedback. Using the device in this manner is typically not communicative. In these situations, the speech-generating devices can still be used with the individual, as they are clearly motivating and interesting to the individual, but in a different manner (as suggested in other skills areas in this section) and with careful supervision. Schepis (1998) reported the following results of a study of the use of voice output communication aids (now known as speech generating devices) by children with autism:

- Young children with autism can learn to use speech generating devices to effectively communicate various language functions (e.g., request, answer yes/no questions, make social comments)
- Speech generating device use was generalized across settings
- Increases in the child’s use of gestures, words and vocalizations occurred
- Communication partner interactions increased



Devices that Use Typing: Some individuals with ASD have found success from typing their messages and either handing the reader the tape they have just typed, or by having a support person read their message as it's being typed. Others prefer to type and utilize voice output to communicate their thoughts.

Speaking Speller—Franklin Products
Link—Assistive Technologies/Mayer-Johnson
Crestalk ABC—Crestwood

Expressive Communication: High Tech Tools and Strategies

Video taping: Expressive vocabulary skills (being able to name items, people, places) can be taught in much the same way as receptive vocabulary skills through the use of video taping. Categorization skills and concepts can also be taught through this medium. As mentioned previously, a variety of language skills (communicative social interaction skills) can also be taught via videotaping.

Devices with Icon Sequencing or Dynamic Display: For the student whose preferred communication method is not verbal, and responds well to the use of simple speech generating devices, it may be reasonable to utilize a more complex device with dynamic display, or icon

sequencing. These products allow for a large numbers of messages (Reed, 2000). A speech pathologist with knowledge about augmentative communication can help determine which, if any, of these types of devices might be helpful.

Devices with Visual Scene Display: Some high tech devices are now utilizing visual scene displays (VSDs) to more easily bridge the gap between cognition and communication. These devices include a full screen that looks like a child’s room, a classroom, an office, or one of any myriad of age-appropriate “scenes.” “Hot spots” are then programmed into the appropriate place on the screen. When Joe wants to watch television, he simply touches the picture of the television on the touch screen of his device and his message is spoken. Low-tech visual scene display options are also available.



In a recent article published by the **SID 12 Perspectives in Augmentative and Alternative Communication**, *Visual Scenes Displays: Low Tech Options*, Weissling and Beukelman described Low Tech Visual Scene Templates, which are available to be downloaded at <http://aac.unl.edu> and www.aac-rerc.com.

About the templates: Visual scene materials can be downloaded (FREE) in a variety of sizes and configurations. The user can size and position digital images, add text to the pictures, edit and print communication and memory materials. A manual can also be downloaded from the site. Microsoft Publisher is necessary for downloads.

Devices with Visual Scene Display

Dynavox V/ V Max

Devices with Icon Sequencing

Springboard Plus—Prentke Romich Company

Vanguard Plus—Prentke Romich Company

Devices with Dynamic Display

Dynavox V/ V Max

Tango—by Blink Twice Inc.

Computer: Some software is specifically designed to provide augmentative communication. Speaking Dynamically Pro is one example. In addition talking word processing programs such as Word Q and Write:OutLoud can be used to speak text that is entered or selected by the student. Some of these may be available online or through your network.



Some individuals with ASD may prefer to utilize a relay service or a TDD (telecommunication device for the deaf) instead of using the phone, especially when in times of high stress.

ACADEMICS

Most students, including many students with ASD, benefit from participating fully in classroom activities. However, many students, especially those with ASD, can learn and absorb information in ways that are not immediately apparent. All students should be encouraged and supported in actively engaging, to the fullest extent possible, in the learning process. Differentiating instruction (see Tomlinson, 2003 or go to www.caroltomlinson.com), and providing varied instruction for all kinds and levels of learners, will support greater participation for all students.

Academics: No Tech Tools and Strategies

Establish predictable, productive classroom routines: If students know what to expect, they are less anxious and better able to participate. Having an established pattern, especially at the beginning of a class, can make for smoother transitions and increased learning.

Present academic tasks in an approachable manner: Break larger assignments into smaller steps; minimize visual overload by decreasing number of problems per page and removing unnecessary illustrations; be careful using open-ended or abstract questions like "tell how you feel and why".

Focus on strengths/use special interests: Students with ASD often have special strengths or interests that can provide meaning, motivation and self-esteem when incorporated into assignments.

Use specific, concrete directions and present them in more than one way (verbal and written or visual): Students with ASD often have unique interpretations of teachers' directions. Avoid misunderstanding and possible conflict by using clear directive words that leave nothing to be assumed or interpreted.

Provide models and demonstrations whenever possible: With a clear, visual example of what is expected, many students will understand assignments better.

Preteach: Introducing students to the content of a lesson before it takes place can provide familiarity and a pre-made "filing system" for information.

Academics: Low Tech Tools and Strategies

File Folder Activities/Structured Teaching Format: The student can independently focus on many academic tasks through the use of file folder activities. Long strips of Velcro can be placed on the inside pages of a laminated file folder. The student can then be given picture/symbol/word cards with Velcro on the back. Matching tasks, sorting tasks, and sequencing tasks focusing on appropriate content (e.g., colors, shapes, alphabet letters, common nouns, familiar people, categories, relationships, concepts from a science unit, etc.) are all appropriate. File folders can also be used for many other activities that focus on reading comprehension skills, math skills,

and others. File folder activities can be part of a broad approach called Structured Teaching. The key is to provide a structure for the presentation and independent completion of activities or tasks. See www.teacch.com or www.specialed.us/autism/structure/str10.htm for information about structured teaching.

Highlighter Tape: Many individuals with ASD possess relative strengths in their reading recognition skills (decoding) but experience significant difficulty understanding what they have read (comprehension). Highlighter tape (a removable colored transparent tape) is an economical, non-destructive way to highlight text wherever needed (Lee Products). Such tape can be used in several ways. For example, a staff member can highlight key words or sentences pertaining to a reading comprehension question in the text. Different colors of highlighter tape can be used to encode different significant concepts (e.g., red to mark dates, yellow to mark people, etc.). It can also be used in other ways. Different parts of speech can be highlighted with different colors (e.g., yellow for nouns, green for verbs) or paragraphs can be color coded to relate to specific study questions (e.g., orange for number 1, green for number 2, etc.).

Magnetic letters, words, and numbers: There are hundreds of magnetic words, letters, and numerals in various sizes of print that can be used to complete assignments and answer questions. This is especially critical if the student is not yet ready to write or keyboard, but can read whole words and create sentences if not hampered by the need to “write.” Beacon Ridge and Magnetic Poetry are two common sources.

Acrylic Easel: If the student is struggling with tracing or writing, a clear acrylic easel can be used to allow the student to follow the movements made by a teacher or therapist, who works from the inside of the easel. This is a precursor to being able to trace already completed shapes or lines.

Work system: This strategy can be used to help a student develop independent work skills. An “in” basket can be placed on the left side of his desk with worksheets, file folders, or “work boxes” that need to be completed. If necessary the worksheets or other tasks could be color-coded for different subjects. An “out” basket is placed on the right side of the desk. The student can see how much has been done and how much still needs to be done. The last item in the “in” basket can be a choice card with two choices of things he likes to do. Work systems are also often a part of the Structured Teaching approach (see file folder references).

Interactive Books: Any book can become “interactive” in a variety of ways: by creating vocabulary cards with matching pictures; by adding Velcro strips with picture, letter or word choices to match to appropriate spots on the pages; or by adding sound, texture, or moving parts.

Number lines, counters, math manipulatives, and multiplication tables: Help students process math facts and calculations.

Raised line or graph paper: Helps students keep numbers and letters organized on the page.

Academics: Mid Tech Tools and Strategies

Attainment 4-Frame Talker or Cheap Talk 4: Each step of the sequence story can be pre-recorded on each of the four buttons in sequential order. The four corresponding sequence story pictures are placed in front of the individual, but not in order. As the individual presses the first button in the left-to-right sequence of buttons, they hear the auditory message for the first sequence picture. The individual can then select which picture corresponds to that message as the first picture in the sequence story and place it on top of the first button via Velcro. This process continues with the subsequent buttons and pictures. Printed sentences can also be used in place of pictures for the sequence story.

VoicePod: The VoicePod is a digital recording and playback system ideal for photos, language cards and communication symbols. It features thirty-six reusable, two-sided sleeves with an ID strip to access recordings. The VoicePod provides a motivating and novel alternative for focusing on sequence stories, which are typically difficult for the student with ASD. The student listens to the sentence on the card, which describes a picture that is part of a story sequence. The student can then put the appropriate picture in sequential order for the story, according to the message given on the VoicePod. It can also be used to practice spelling words, math facts, history dates, and any key concepts from subject area classes.

Four message speech generating devices: These devices (as described in the previous section on Expressive Communication) can be used as a motivating way to focus on phonics. Each button can be prerecorded with a sound from a three- to four-letter “sound” word (e.g., “dog”). The student then chooses the corresponding letter card to match to the recorded sound. For example, the first button of the Talk Pad is recorded with the sound “d.” The student chooses from a selection of the three letters that comprise “dog,” as well as the entire written word. He or she then puts the letter that matches the sound on the first button, using Velcro. The student progresses through each button in the same manner. The final button says “dog”, and the student matches the whole written word “dog” to this final button. The same technique can be used for a simple math problem or parts of a science concept.

Word Processing programs and tools: Great options for students who struggle with writing. See "Motor" section.

Calculators: Can be an excellent way for students to access more advanced math content when fluency and calculation skills might hinder progress.

Overhead Projectors: Still in use; can provide a unique way to approach teaching and an opportunity to stand and engage more of the body while working on problems.

Academics: High Tech Tools and Strategies

Video Taping: The use of video can provide students with visual images of many academic processes from writing to creating projects to working in a team. A wide assortment of cameras and editing programs are available to make creating videos easy.

Computers: Computers are often highly motivating and engaging for students with ASD. Learning on the computer lacks the ambiguities and distractions of other teaching methods in the classroom. Research has shown that using computers can increase attention and decrease anxiety-related behaviors in students with ASD. They provide a predictable, concrete learning environment that is often self-directed and self-paced. Computer use can provide students with a sense of control and consistency in a world that generally affords them little of either. Using the computer (and Internet and software programs) can be incorporated into home and classroom learning in more ways than we can enumerate: as a reward, as a means for more in depth learning, as an activity in independence, as a curriculum option, or as a social setting (online or games).

Interactive Storybooks (software or online) or e-books: These tools use the computer to make reading activities even MORE engaging!

Online Learning: The learning and teaching opportunities available through the Internet are amazingly numerous and varied. Free lessons and even courses of study in almost any subject area are available online. In addition, virtual schools, distance education classes, webcasts and podcasts can provide instruction with more personal connection to teachers, presenters and other students. Many formats, including Moodles, blogs and wikis, can be used for creating online learning environments.



While computers provide an excellent format for teaching academics, many students with autism have social interaction challenges that are very difficult to address outside of real social situations. Interactive on line courses and, to an even greater extent, online communities can provide good, low stress social practice. However, for students who typically have trouble generalizing, there is no substitute for face-to-face contact.

Adaptive Hardware: Some students with ASD might require adapted computer access, that is, access via a different mode than the standard mouse or keyboard. Listed below are devices that can assist students in accessing the computer.

Touch Window: This touch screen can be easily mounted on the computer monitor with the student simply touching the screen to emulate mouse actions. Use of a touch screen can assist a child who experiences difficulty understanding the abstract relationship between mouse actions and screen actions. With a touch screen, the concrete relationship between what the student sees and what the student directly activates is established (Reed, Gierach, Walser, Sheets, Cumley, Lynch & Wirkus, 1997).

IntelliKeys: This is a popular alternative keyboard that easily connects to a computer and works with either Macintosh or Windows. The student simply pushes various locations on an overlay placed in the IntelliKeys to access programs. Standard overlays for the alphabet, numbers, mouse directions and for use as a single switch hit are included with the IntelliKeys. However, various overlays can also be created to go with numerous

software programs through the purchase and use of additional IntelliTools software programs. In addition to acting as an alternative keyboard, the IntelliKeys has four switch jacks located on the side of the keyboard so that a single switch or multiple switches can be connected to the computer through the IntelliKeys.

Big Keys and Big Keys Plus: An alternative alphabet keyboard that has been specifically designed for young children. The keys are large (1 inch square) with the various alphabet letters color-coded to help children more readily find specific keys (vowels in one color, consonants in a different color). The keyboard is also arranged in ABC order for easy access for younger children. This keyboard is available from Greystone Digital

Trackballs: Trackballs come in various sizes and shapes and allow the individual to move the mouse around the screen by rolling a stationary “ball” around with either their fingertips or hand. Some individuals with ASD can more easily learn to initially understand mouse operations via a trackball, with eventual skill transfer to use of a standard mouse. Trackballs can be purchased from numerous retailers for varying amounts.

Of the hardware mentioned, the IntelliKeys is perhaps the most versatile. A student who utilizes concrete objects to communicate can use it. Miniature objects or parts of objects can be attached to an overlay with Velcro so that the student can activate the computer to say a sentence, sing a song, or tell a story, simply by reaching for and touching the object. It can also be used by a higher functioning student to sequence facts, retell a story, or demonstrate steps of a science experiment. By creating appropriate overlays, the teacher can set up the IntelliKeys so that a student can answer comprehension questions for reading, social studies, health, etc., utilizing whichever visual representation system is appropriate.

Software: There are numerous software programs available that can focus on a variety of skill areas such as language skills, attending skills, problem solving skills, fine motor skills, academic skills, as well as provide appropriate leisure time activity ideas. This is not a comprehensive list of all software available.

Software for Reading:

Picture It (Slater Software)

Edmark Reading Programs (Riverdeep)

Survival Signs (Attainment)

Software for Writing with Pictures: Some students with ASD read and/or understand pictures and words before they are able to write or spell. There are very useful software programs for students whose understanding exceeds their physical ability to write.

Communicate: SymWriter (Mayer-Johnson) for Windows

Pix Writer (Slater Software) for Windows and Mac

Clicker 5 (Crick Software) for Windows and Mac

Software for Writing with Letters: Often a student with ASD recognizes letters and words before he or she is ready to learn to keyboard. An inexpensive software program, *Kids Time Deluxe* (Great Wave Software) can be especially helpful. *Kids Time Deluxe* has an onscreen keyboard, where the letters are displayed across the bottom of the screen. Using the mouse the student clicks on the letters to spell words and sentences. This can be very useful at kindergarten, first, and second grade before the child is ready to learn keyboarding.

Software for Thinking: Children with ASD often struggle to understand more abstract concepts. *Inspiration/Kidspiration* is software that can help them understand and process information more effectively through the use of concept mapping and flowcharts.

Software for Math: There are a number of math programs now available that allow a student to complete math assignments. These programs can provide a variety of supports if needed.

Access to Math (Don Johnston)

Math Pad (IntelliTools)

Software in the Content Area Subjects: There are virtually thousands of software programs now available that can be used to replace or supplement the content being studied in regular education classrooms. Software that provides a rich visual source of information may be the vehicle by which a student can access the general education curriculum along with his or her non disabled peers. Examples might include: *Imagination Express Series* (Edmark)

Accessory Equipment:

SMARTBoard: A SMARTBoard (or an interactive white board) with Notebook software can provide a wide variety of organizational and curriculum materials that can be extremely engaging for students with ASD.

Digital camera: A digital camera can be useful to educators and parents in making two-dimensional visual representation systems for students who more readily comprehend pictures from their customary environments. These pictures can be used as the visual representation system in all of the suggestions included in this manual.

Scanner: A scanner can be used by educators and parents to scan in numerous materials, such as books, CD covers, video covers, etc. to meet the student's individual needs regarding the various suggestions given in this section. In some cases a student with ASD can also use this equipment to complete tasks. Arthur used a scanner in his Work Experience program to scan textbooks for use by others that could not read text, such as individuals with vision impairment or dyslexia. He scanned the books and then carefully checked them to insure that the computer had accurately translated the text.

ORGANIZATION

We use executive function when we perform such activities as planning, organizing, strategizing and paying attention to and remembering details. People with executive function problems have difficulty with planning, organizing and managing time and space. Students with ASD may have greater difficulty in organizing and sequencing materials due to deficits in executive functioning (Mesibov, Shea, & Schopler, 2005). Thus, it may be difficult for students with organizational issues to know how long completing an assignment will take. Students with ASD may struggle with bringing the correct textbooks home to complete various homework assignments. Even personal organization, such as figuring out how to pick up books, folders, writing utensils, etc. and carrying them to the next classroom can be challenging. Trial and error and defining a system for the student with autism (preferably as early as possible) can help prepare that individual for success later in the educational, home and work environments.

Organization: No/Low Tech Tools and Strategies

Students with ASD may be more effective with a defined, structured organizational system at their table/desk as well as at their locker or cubby. Setting aside defined “work space” or even defining specific environments for specific tasks may be useful. Using schedules, “to-do” lists and assisting the student by directly instructing use and consistent modeling of these tools can be beneficial to the student. Older students might benefit from learning to eliminate clutter from their workspaces, both at school and wherever they do their homework outside of school.

Other potential tools are:

- In/out boxes
- Color coding
- File folder system
- Highlighting specific information
- Modified worksheets (more or less space between questions)
- Daily, weekly or monthly calendars
- Schedules (daily, activity, special)
- Notebooks (e.g., “Trapper Keeper”)
- Structured work stations
- Checklists/ “To Do” Lists

Organization: Mid Tech Tools and Strategies

Organization is difficult for each of us and especially for students with autism. It requires an understanding of what one wants to do and a plan for implementation. These requirements are sufficiently complex, interrelated, and abstract and present formidable obstacles for students with autism. When faced with complex organizational demands, they are frequently immobilized and sometimes never even able to begin their required tasks. Many students experience increased independence when they are introduced to tools such as those listed on the next page:

- Concept-mapping software and templates.
- Simple speech generating devices (many of which were described in previous sections) can be used for organizing steps in a sequence. A Step-by-Step is one example.
- Pagers/electronic reminders can assist with independence.
- Multi-channel digital recorders, such as the VoiceOver, could be used by students to organize information, assignments, etc.
- Vibrating, light and sound timers are small, digital timers for students who need to keep track of time in different ways. They include notifications that vibrate, make a sound, or flash, and you can select any single or combination of alarms.

Organization: High Tech Tools and Strategies

The following list, though not exhaustive, are examples of tools that should be considered for some students with Autism.

- Use cell phone features such as to-do list and alarms.
- Personal Digital Assistant (PDAs) are portable and offer many features including electronic scheduling tools, memos, alarms, to-do lists, email, web accessibility, etc.
- Electronic scheduling tools (like Outlook) are electronic planners and are often more efficient than paper planners because one schedule is usually integrated in many views. With one click you can see a daily plan, as well as weekly and monthly.
- For older students, consider direct deposit for paychecks and online banking for paying bills.
- Time Timer Watch Plus (described in the Transition section) can be a useful tool for organization when students utilize the time-of-day alarm, and timer pre-alarm and alarm features.
- The WatchMinder2 has two modes, the reminder mode and the training mode. Both modes can be operational at the same time. The reminder mode is useful for remembering specific tasks like taking medication and doing homework or chores. The training mode is useful for behavior change and self-monitoring. The watch has 30 daily alarms. Reminders can repeat daily or can be scheduled for future dates and times.
- Casio DataBank Watch has 150 alarms that can be set up to a year in advance
- iGoogle is a Web 2.0 tool where students can add tools such as to-do lists, calendars, calculators, etc. to a homepage to assist with personal organization.
- Writeboard is a Web 2.0 tool that students can use to write collaborative or independent reports. It tracks changes and saves work to a website.

BEHAVIOR

Although challenging behavior is often a “presenting problem” for students with ASD, it is the focus of this section to use tools and strategies to prevent challenging behaviors (proactive) rather than to address behavioral interventions (reactive). Because of the unique features and characteristics of ASD, challenging behaviors can occur. For example, individuals with ASD frequently have such difficulty understanding oral language that behavior appears to be non-compliance, when it is simply a lack of understanding of the request or command (Fouse & Wheeler, 1997).

In developing proactive, positive behavior supports, be sure to address the unique needs and characteristics of autism in addition to looking for the *functions* of specific behaviors. Students with autism may engage in challenging behaviors for very different reasons than neurotypical students do. Because these functions may be unclear or confusing, the educational team may want to consider a formal or informal Functional Behavior Assessment to be sure interventions and supports address the true cause of the behavior. See your school psychologist or director of special education for more information on your district’s policy regarding functional behavioral assessments.

Behavior: No Tech Tools and Strategies

Understanding ASD: All staff should have the understanding that the student with ASD has a developmental disability that causes him to respond and behave in a way that is different from other students. Most importantly, the behaviors exhibited by the student should not be misinterpreted as purposeful and manipulative behaviors. Anxiety and confusion are often major factors in behavior problems in students with ASD.

Behavior or Sensory Need: As discussed in the Sensory section, sensory needs are sometimes mistaken for challenging behaviors. Discussion with those who work and live with the individual with ASD and trial of a variety of sensory input methods (with the consultation from an occupational therapist) may provide information in this area.

Behavior: Low Tech Tools and Strategies

Many people who work and live with individuals with ASD are challenged with determining strategies for dealing with inappropriate or even aggressive behavior. Determination of the cause for the behavior can often result in a suggestion for prevention or reduction of that behavior. When experimenting with a variety of strategies (e.g., removal from the situation, redirection, prevention by not placing the individual in that situation), it may be helpful to determine if challenging behavior has also increased in the other environments in which this individual lives and works.

Visual Supports: The wide variety of schedules and other visual supports discussed previously have often been useful in helping the individual to better understand the expectations upon him or her. Review receptive and expressive communication for specific ideas to help the student understand and/or communicate about the events and activities that are occurring. For example, the use of the universal “no” symbol reminds the student to stop what he is doing.

Rules/Alternative Behaviors: Displaying rules in a visual form allows the student to more readily understand exactly what the expectations are for specific activities, tasks, and situations. These rules also help to identify, in a concrete way, exactly what actions or alternatives are acceptable, which typically results in more consistent behavior (Hodgdon, 1995). In addition, visual representation of rules and alternative behaviors allows for the student to improve his or her own self-regulation and self-management skills by removing the support often given by an adult in the environment and placing the focus on the visual support strategy.

Class rules or individualized personal rules taped to desk: These rules should again be represented via a visual representation system that the student can understand (written words, line drawings, etc.). If the student is engaging in an inappropriate behavior, he or she can be directed to look at a specific rule (e.g., “Read rule number 3.”)

“Good Choices That I Can Make” list: This visual support strategy assists the individual in understanding and making appropriate choices. This strategy is especially useful when the student has “broken” rules or engaged in inappropriate behaviors. This list should be within easy visual access to the student and should initially be referenced by a staff person to teach the student how to utilize this list. For example, if a student is making inappropriate noises at the beginning of a math assignment, with math typically being a difficult subject for the student, an adult can first direct the student to the appropriate rule visually represented on their desk. This can be done by either pointing to the rule or stating “Look at rule number __,” which states, *sit quietly and do my work*. The staff person should then reference the individual to his or her “Good Choices That I Can Make” list. If the student appears to be experiencing difficulty with the assignment and needs to request assistance, the staff member may even initially point out which specific choice the student should make in that circumstance. This strategy will greatly assist the student with ASD in developing behavioral self-management skills. The following “Good Choices That I Can Make” list is an example list:

1. I can raise my hand to ask questions or get help.
2. I can ask more questions if I still don’t understand.
3. If I don’t understand what someone is saying or doing, I can ask him or her.
4. I know that my own words and actions can make people feel differently than I do.
5. I can use “I” messages to tell people how I feel. (“I feel bad when you tell me it’s inside recess”)
6. I can write down the problem and then think of appropriate things that I could do.
7. I could use relaxation strategies. “Take a deep breath, count to 10, breathe out slowly”
8. I could ask for time-out (break) all by myself.
9. I can make good choices.

Individual rule/behavior cards: These visual representation cards can be kept on a metal ring and used when needed either singly or in succession. Use of the universal “no” symbol should be drawn or superimposed in red on top of the PCS or photo when appropriate to clearly indicate that a specific behavior should **not** occur. An example might be PCS laminated on large index cards to communicate the following. “Look at Mrs. Jones” (PCS of eyes); “Sit on chair” (PCS of an individual sitting in a chair); “Shh, be quiet” (PCS of a face with their finger to lips indicating, “Shh.”); “Don’t hit” (universal “no” symbol on top of PCS of a person hitting another person).

Specific Location or Situation rule cards: This strategy may be used to help the student understand where he or she is going and what is expected in this environment. An example of this is if the group is going to McDonald's. A photograph of McDonald's is laminated to an index card. On the back of the card, specific “rules” for McDonald's are visually represented.

If something is bothering me I can...: This support strategy visually assists the individual in choosing appropriate alternative behaviors when he or she is experiencing anxiety or stress. This card can again be taped to the desk with the above heading and the following examples, or placed in a small photo album which contains other visual support strategies such as “morning routine”, “homework checklist”, or others:

- raise my hand for help
- close my eyes and count to 10
- take 5 big breaths
- ask for a break

Self-Regulation Scale: Number scales, thermometers, or other concrete visual representations (volcanoes, car engines) of changing arousal/anxiety/vocal levels can help students understand their levels and teach them proactive strategies to get back to more comfortable and productive levels (Dunn Buron and Curtis, 2003). For example:

3 (red)--picture of crazy face→go to safe place
2 (yellow)--picture of worried face→take deep breaths
1 (green)--picture of happy face→earn rewards

The keys to successful use of self-regulation scales are finding and practicing helpful calming or arousing activities, focusing on identifying and intervening at levels *before* behavior is out of control, modeling and practicing the process in low stress situations and remembering to make the strategies positive not punitive even at the highest levels.

Calming Down Activity Board: Create a picture- or word-based board with the steps of calming down (e.g., go to a quiet place; sit down; fold hands; breathe slowly; count to 10; etc.) (Adams, 1997).

Stimuli Tolerance Activity Board: If a student needs help tolerating specific events that are challenging, such as the bell ringing to indicate the end of class, a specific activity board can be created. Adams (1997) suggests a board that shows a picture of the unpleasant stimuli, in this case a bell, followed by the steps to help him or her tolerate it (e.g., think about something pleasant, such as a song he or she likes, and then proceed).

Activity Termination Signals: The visual symbols (“go”, “almost done”, and “stop”) can also be used to prevent escalating behavior due to a student’s lack of understanding of when he or she will be allowed to stop an activity that is challenging or at least not as pleasing as some others. Data will need to be taken initially to get a general idea of how long a student will continue with a particular task. For example, a student will attend to a particular task for approximately 45 seconds and then throw the materials aside to indicate that he or she is finished with the task. To initially teach the significance of the “go”, “almost done”, and “stop” cards, timing is of the essence. The “go” card is presented at the beginning of the activity, the “almost done” card must be given after approximately 30 seconds (as we already know the student will throw the materials after 45 seconds), and the “stop” card is given at about 40 seconds, with the activity immediately ceasing. It is critical to initially use the cards to “stop” the activity prior to the student throwing the materials, so that the student realizes the significance of the cards in relaying the messages of being “almost done” and “stopping.” It is important to note that the “almost done” card is always given to the student within a short time frame of giving them the “stop” card. Consistency is important in using these cards to avoid negative behavior.

Motivation: For students with ASD providing a *reason* to do something that doesn’t appeal or make sense to them (why would I sit in class and listen to a boring teacher if I didn’t have the social awareness to care about the consequences of leaving?) can be an important part of supporting behavior choices that we see as positive. Using special interests in the curriculum and establishing predictable routines can be sufficiently motivating for many students.

Reward cards, which visually illustrate what the individual is earning (stars, check marks, smiley faces) and how, can motivate behavior improvement throughout the school day or in certain predictably difficult situations. Students can see exactly what behavior they are being rewarded for and how. Systems that withhold rewards can cause more anxiety, so be sure to find something to reward on a regular basis.

Power Cards (Gagnon, 2001)

For students with particular interests or role models, Power Cards can provide both clarification and motivation. Simply identify the difficult situation and the desired behavior or actions. Then create a scenario where the character, animal, or person of interest struggles with similar issues and takes that action. For example, if a student loves firefighters and has a tendency to run away and hide when he is stressed, the following story for a Power Card might be used: (the card is illustrated with pictures of fire fighters and fire trucks):

Firefighter Joe has an important job. People are grateful for his help. Sometimes, Joe feels like running away when he is upset or scared. But he knows that his friends will worry if he goes away without telling anybody. So, when Joe feels like running away, he takes deep breaths and asks the Fire Chief if he can take a break in a safe place. I will try to be like Joe. If I feel like running away, I will try to take deep breaths and ask my teacher for a break.

Behavior: Mid Tech Tools and Strategies

Time Timer: A Time Timer or other visual timer may be used to let the student know how much time is remaining. This is especially helpful if the student does not like the task very well or is eager for the next task.

WatchMinder: This special wristwatch is a reminder device to help in a variety of ways. It has a silent vibrator alarm system (similar to that of a common pager), an eight-character display for messages, 16 daily alarm settings, as well as training and reminder modes. It can be preset with specific behavioral reminders for certain activities or times of day when the student typically has difficulties. The entire day can be programmed with numerous messages displayed at the appropriate times.

Audio or video recording can be used to focus on a number of communication skills to draw the student's attention to inappropriate communicative behaviors (e.g., interrupting, preservative speech, incessant question asking, topic maintenance, etc.) as well as to develop self-awareness and self-regulation of appropriate communicative interactions.

Behavior: High Tech Tools and Strategies

Computer: KidTools (Fitzgerald & Semrau, 2000) is a software tool that students can use to create their own self-management materials. When students create their own behavior plans, they take responsibility and build internal controls for behavior. For the student who is capable of doing this, KidTools can be a valuable tool.

The use of the computer with a variety of fun games can be a reinforcing activity as well as a calming choice. The specific software will need to be selected for the individual student.

Flow charts: Inspiration and Kidspiration are concept mapping software programs that can help students visually represent a chain of events from challenging situation through the consequences of two or three behavior choices. Simply understanding how behavior choices lead to positive or negative social consequences can help students understand why making better choices makes sense.

Videos: Students can create a series of short public service announcements explaining appropriate school behaviors or defining class rules. Seeing the rules in action can make them much more understandable and concrete.

SOCIAL INTERACTION

Social Interaction: No Tech Tools and Strategies

Specific opportunities to practice social interaction skills need to be scheduled during low-stress times of the student's day and in environments that are neutral or calming. Often, direct instruction of specific skills may be necessary before the individual is able to generalize the social skills into the natural environment. The individual with ASD also may require retraining of the skill once other people or other environments are introduced.

Peer in-service and autism awareness training can improve the social experiences of children with ASD by helping the people around them adapt to their needs. Since neurotypical adults and children usually possess more flexible social expectations, this is often the easier path to improved social engagement for people on the spectrum.

Social Interaction: Low Tech Tools and Strategies

As the student with autism spectrum disorder will need to be directly taught various social skills in a one-to-one and/or a small group setting, various low tech strategies can be used to focus on increasing this skill area. In addition, social skills training will need to address the student's possible difficulty in generalizing this information to other social contexts, which can also be accommodated through appropriate low tech support strategies.

Social Stories: Use of Social Stories (Gray, 1993) provides the student with visual information/strategies to use that will improve his understanding of various social situations and teach specific behaviors to use when he is interacting with others. Social Stories are written in first person and are individually written for each student for the social situations that are difficult for that individual (e.g., staying in assigned seat on the bus, waiting in line). The Social Story should be visually represented in a mode that the student can most readily understand (e.g., written words, line drawings and written words, photos and written words). The repetitious "reading" of the Social Story, at times when the individual is not engaged in the challenging social situation is what leads to the success of this strategy. We suggest two 3-ring binders of identical Social Stories, kept in page protectors for both at home and school, for the student to read at his or her leisure. This has been proven to be a very successful strategy for many students in learning to recognize, interpret and respond appropriately in a variety of social situations.

Social Scripts: Although similar to Social Stories, Social Scripts involve the development of an actual script for a specific social situation. The Social Script is individualized and is dependent upon the specific social situation(s) with which the student is struggling. For example, Joey has difficulty asking peers if he can join in their "ball-tag" game at recess. He typically runs in the midst of the game, takes the ball and then runs away. The script would read: "Joey: 'Hi guys. Can I play 'ball-tag' with you?' Other boys: 'Yeah, Joey, but you will have to wait over there until it's your turn to throw the ball.' Joey: 'O.K. I'll wait until you tell me it's my turn.'" Use of Social Scripts can also assist in role-playing these various social situations with peers. Puppets

and other methods can also be utilized. Social Scripts can also be used to visually, and thus clearly, indicate what went “wrong” in a social situation.

Comic strip conversations: These are used to visually clarify communicative social interactions and emotional relations through the use of simple drawings. Comic strip conversations are used to visually “work through” a problem situation and to identify solutions (Gray, 1994).

Turn-taking cards: These cards are useful for visually representing and marking whose turn it is. Typically, these cards utilize a visual representation mode (PCS, object, written word, etc.) familiar to the student and thus, are a very effective means to teach this social skills concept.

“Wait” cards: This tool helps to visually represent the abstract concept of “Wait” with a large orange-colored oval card printed with the word “wait”. These cards can be used at any time to represent the abstract concept of “waiting” (e.g., place the “wait” card on the computer monitor while waiting for the computer or a program to boot up, have the individual hold the “wait” card while waiting in line.)

“Help” cards: These tools aid in teaching the individual the abstract concept of raising his or her hand to indicate that help is needed. An “I need help” visual representation (PCS, photograph, written word taped to a craft stick or object) is used for the student to raise up in the air to indicate that he or she needs help. The item that he or she raises in the air can gradually be eliminated until the individual is readily raising only his or her hand to seek assistance.

“Waiting hands” card: An outline of a person’s open hands on colored paper is used as a guideline as to where the individual should place his or her hands while waiting—either for his or her turn, a chance to perform an action, or other activity.

Social “rule” cards: These can be taped to the student’s desk in the classroom (e.g., “I will raise my hand and wait for the teacher to call on me”). For various environments other than just the classroom, one “rule” card per environment can be developed. It can be written on index cards and laminated and then given to the student to carry along as a visual reminder of the social “rules” for that particular context. For example, social rules for the library might include: “I will sit at a table with at least one other student.” “I will discuss my book with one other student.” “I will discuss one other student’s book.”

Social Interaction: Mid Tech Tools and Strategies

Some of the items previously mentioned in this section can be used very successfully to teach social skills.

One message devices: These devices can help the individual with ASD participate in turn-taking activities. Countless turn-taking activities can be created and incorporated into every aspect of the school day. Opportunities during “circle time” include: taking turns pushing the device to respond to prerecorded calendar routines, songs and books (repetitive lines work great); “turn the page” during large group reading; “my turn” as a visual/physical marker during focus on specific

turn-taking tasks; and others. Older individuals may benefit by initiating a conversation with a peer by using the device to say, “Did you see that Packers game on Sunday?”

Other speech generating devices: Other speech generating devices that offer four to eight or more messages as mentioned in Expressive Communication may be used to sequence the social script or social story for repeated review and practice.

Audio recording: Any type of social interaction, both appropriate and inappropriate, can be taped and then replayed as a teaching method to assist the individual in identifying and discussing social communicative behavior. Examples include interrupting, asking for assistance, drawing attention, initiating varied topics, maintaining topics initiated by others, etc. Focus on various nonverbal social communication skills, such as awareness and use of appropriate volume or emotional tone of voice, can be addressed through the use of audio taping. If needed, visual supports can be created to be used along with the audio tape to help the student understand what happened and what could be done to make the situation go more smoothly in the future.

VoicePod: The VoicePod is a digital recording and playback system ideal for photos, language cards and communication symbols. It features thirty-six reusable, two-sided sleeves with an ID strip to access recordings. For an individual who is able to imitate, the VoicePod could be used as an imitative model for the individual to use to engage in a social interaction. For example, at the end of a student’s activity schedule book is a VoicePod card with a picture of bubbles and the written words “I want bubbles.” The student then places the card in the VoicePod sleeve and inserts it into the VoicePod to hear it. He could then take the card and gives it to someone while repeating the utterance.

Social Interaction: High Tech Tools and Strategies

Video recording: A variety of social situations can be videotaped and replayed to teach identification of appropriate/inappropriate social behaviors, as well as emulation of appropriate social behaviors in various social contexts. Videotaped segments of any area in which the individual is experiencing difficulty can be viewed (e.g., interrupting others, asking for assistance, drawing attention to communicative utterances, initiating varied topics, maintaining topics initiated by others, perseverant utterances or question asking, etc.). Non-verbal social communication skills can be effectively taught through videotaping (e.g., tone of voice, facial expressions, body postures/language, gestures, personal space, vocal volume, etc.). In addition, how to appropriately engage and/or interact in various social contexts (such as recess, lunch, music class, McDonald’s, church, etc.) can be taught via videotaping. Facial expressions showing various emotional states can also be videotaped to teach identification of various emotions/feelings.

Computer: The computer can be used to review appropriate social behaviors in much the same way that the Social Stories, Social Scripts, and audio and videotaping used. The specific script can be presented in pictures or line drawings with printed words. Then the student can use the mouse (or adapted input such as the IntelliKeys) to place the pictures in the correct sequence.

The computer can be set to speak the words or the student can read them. Online support and interaction systems can also be a valuable resource for people on the autism spectrum.



A parent reported that one of the favorite activities of her son, a 19-year-old with Asperger's Syndrome, was viewing reruns of "value-based sitcoms" like M.A.S.H. During commercials, the family would discuss the dialogue and the social interaction that occurred within that segment. The young man learned a variety of interaction styles (e.g., how men interact with men in authority, how men interact with women) and the family enjoyed an educational and appropriate social activity. (Credit to Dene Muller, La Farge, WI)

TRANSITION

Transition: No Tech Tools and Strategies

The opportunity to practice the steps of the transition with a partner at low stress, quiet times can be very helpful. For instance, if changing classes is so hectic that a new high school student loses his or her way, practicing the route while others are in class can help prepare the student for the actual transition. The next step can be to arrange the timing so that he or she is near the end of the route and can see their destination before other students fill the hall. Every few days, as they get more familiar with the route, he or she can start a few seconds later.

Transition: Low Tech Tools and Strategies

There are a variety of low tech tools and strategies that can be used to assist a student with transitions. Many of these were already described in the Receptive Communication section. The single most important tool for transition is the daily visual schedule.

Activity Termination Signals: The use of Green-Yellow-Red cards (as described in Receptive Communication and Behavior) can be helpful in letting the student know that an activity that he likes, such as recess, or choice time, is coming to an end. Hand the student the green card at the beginning, yellow when there are only a few minutes remaining, and red when it is time to stop. It can also be used for a group by substituting colored cups instead of cards. The green cup may be set on top of the computer or table at the beginning of an activity. The yellow cup is put over the green cup as the end nears (when one to two minutes remain), and the red cup is placed on top of yellow, when the time is up.

Object Cues: For some individuals with ASD, it may be helpful for them to carry or be given an object that will signal the movement to a new activity. This signal may be any object that will cue the user to go to check his or her schedule to see what activity is going to occur next. Auditory or visual cues may also be helpful, such as a small bell jingling, turning off and on lights, and playing music to signal an upcoming activity.

Mini-schedules: Mini-schedules include the individual steps of a specific activity. A mini-schedule can be created to map out the specific steps of a transition. (They are described more fully in Receptive Communication.) For example, Lori had the habit of sitting on the floor under a table at the back of the room each time she returned from recess, lunch, or other activities outside of the classroom. A mini schedule was developed with the following steps:

1. Walk quickly to the classroom.
2. Sit in your desk chair.
3. Look at the paper on your desk for your first activity.
4. Wait for your teacher to give more instruction.

As long as there was a paper on her desk, Lori was able to complete the steps.

White board: A small white board can be used to facilitate transitions “in the moment.” Write or represent what’s coming next, or “first/then,” or a count down to the transition time.

Universal “No” Symbols: This is a powerful visual reminder of things that will not occur today. It is described fully under Receptive Communication.

Lightening Bolt/Change symbol: This is used to indicate a new or unusual event. It is described under Receptive Communication.

Go! Board: This picture schedule system from Enabling Devices is quick and easy to use. Each picture or symbol is placed in an icon holder on the Go! Board. After the activity is completed, it is removed and placed in the box at the bottom of the board.

Transition: Mid Tech Tools and Strategies

Transitions may also be eased through the use of speech generating devices. Users may benefit from having an auditory as well as a visual cue of what is going to happen next during the day. A vision of increasing independence should always be the impetus for making more seamless transitions between activities.

Timers: Use of a timer (e.g., an egg timer, kitchen timer, or specially designed visual timer such as the Time Timer) can provide assistance to many students with ASD in providing much needed time constraints and structure for completing tasks. When given an unlimited amount of time, these students typically take an extended amount of time for task completion. However, caution should be taken in the use of a timer in that some individuals have become highly interested (distracted) in the amount of time that is ticking away on the timer, and thus become less attentive to completing the task.

WatchMinder: The WatchMinder (described in the Behavior section) can be a useful tool for transitions as it will display up to 16 steps of a sequence.

Time Timer Watch: A watch that communicates elapsed time and could assist students with increasing independence when in transition.

Time Timer Watch Plus: Time Timer Watch Plus communicates elapsed time and has the capability to set a time of day alarm, set up to twelve hour timers with pre-alarms to increase independence in transition.

Transition: High Tech Tools and Strategies

Videotaping: Videotapes can be made of the steps of the transition. This allows the student to watch it many times if needed or desired.

CONCLUSION

It is interesting to note that the majority of strategies listed in this section fall under the category of “low” technology and should therefore be easily accessible to all at a relatively low cost. It is important to consider that all of these suggestions, from “low” tech to “high” tech, should be individualized to meet the unique needs of any student with autism spectrum disorder. Additionally, it is reiterated that use of any of these strategies requires training, consistency and modeling. Most importantly, use of these various supports will greatly increase the individual’s independent functioning skills by decreasing the amount of direct support needed from another person.

Section 5- References and Resources

References and Resources

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REFERENCES

- Adams, J. I. (1992). *Autism-PDD: Strategies for Parents and Professionals*. Kent Bridge, Ontario, Canada: Adams Publications.
- Adams, J. I. (1997). *Autism-PDD: More Creative Ideas*. Kent Bridge, Ontario, Canada: Adams Publications.
- Attwood, T. (1998). *Asperger's Syndrome: A Guide for Parents and Professionals*. London: Jessica Kingsley.
- Bloomfield, B.C. (2000). Icon to I Can: A visual Bridge to Independence. Paper presented at the TEACCH International Conference. Chapel Hill, NC.
- DeCoste, D.C. & Jacobs, M. (1996). Assistive Technology and the Literacy Continuum. Presentation at Closing the Gap Conference. Minneapolis, MN.
- Dunn Buron, Kari and Curtis, M. (2002). *The Incredible 5 Point Scale: Assisting Students with Autism Spectrum Disorders in Understanding Social Interactions and Controlling Their Emotional Responses*. Shawnee, KS: Autism Asperger Publishing Co.
- Fitzgerald, G. & Semrau, L.P. (2000). KidTools: Friendly Software for Children to Create Self-Management Materials. Paper presented at the Council for Exceptional Children Conference, Vancouver, BC.
- Fouse, B. & Wheeler, M. (1997). *A Treasure Chest of Behavioral Strategies for Individuals with Autism*. Arlington, TX: Future Horizons, Inc.
- Frost, L. A. & Bondy, A.S. (1996). *The Picture Exchange Communication System Training Manual*. Cherry Hill, NJ: Pyramid Educational Consultants, Inc.
- Gagnon, Elisa. (2001). *Power Cards: Using Special Interests to Motivate Children and Youth with Asperger's Syndrome and Autism*. Shawnee, KS: Asperger Autism Publishing Company.
- Gray, C. (1993). *The Social Story Kit and Sample Social Stories*. Arlington: Future Horizons
- Gray, C. (1994). *Comic Strip Conversations*. Arlington: Future Horizons.
- Hileman, C. K. (1996). Computer Technology with Autistic Children. Paper presented at The Autism Society of America National Conference, Milwaukee, WI.
- Hodgdon, L. A. (1995). *Visual Strategies for Improving Communication*. Troy: Quirk Roberts Publishing.

- Hodgdon, L. A. (1999). *Solving Behavior Problems in Autism*. Troy: Quirk Roberts Publishing.
- Jordan, R. (1995). Computer Assisted Education for Individuals with Autism. Paper presented at the Autisme France 3rd International Conference, Nice.
- Lehman, J. F. (1997). A Review of Kids Software for Children with Autism Spectrum Disorder. *Jill Fain Lehman Home Page*. www.cs.cmu.edu/~jef/db.html.
- McClannahan, L. E. & Krantz, P.J. (1999). *Activity Schedules for Children with Autism*. Bethesda, MD: Woodbine House.
- Mesibov, G., Shea, V., & Schopler, E. (2005). *The TEACCH approach to autism spectrum disorders*. New York, New York:Plenum Press.
- Peterson, S. (2000). *Picture Exchange Communication System*. E-mail exchange, February, 2000.
- Reed, P. (Ed.). (2004). *Assessing Students' Need for Assistive Technology*. Oshkosh, WI: Wisconsin Assistive Technology Initiative.
- Reed, P. Gierach, J. Walser, P., Sheets, L., Cumley, J., Lynch, K., Wirkus, M. (1997) *Designing Environments for Successful Kids: A Resource Manual*. Oshkosh, WI: Wisconsin Assistive Technology Initiative.
- Schepis, M. (1998). Evaluation of Speech generating devices by Children and Adults with Severe Disabilities. *Journal of Applied Behavior Analysis* Winter, 1998-99.
- Sheets, L. & Pallaske, M. (2000). Motivation, Materials, & Magnets: Birth to Three Make and Take It. Training provided at Wisconsin Assistive Technology Initiative Summer Institute on Assistive Technology.
- Tomlinson, Carol Ann. (2003) *Differentiation in Practice: A Resource Guide for Differentiating Curriculum*. Alexandria, VA: Association for Supervision & Curriculum Development

PRINT RESOURCES & VENDORS

AbleNet, Inc. 1081 Tenth Ave. SE, Minneapolis, MN 55414-1312.

800-322-0956, <http://www.ablenetinc.com>. (BIGmack, Step-by-Step)

Advanced Multimedia Devices, Inc. 31 Watermill Ln., Great Neck, NY 11021.

800-353-2634, <http://www.amdi.net> (Source for Tech Four, Tech Speak and Tech TALK)

Attainment Company P.O. Box 930160 Verona, WI 53593

<http://www.attainmentcompany.com/xcart/product.php?productid=16148&cat=278&page=3>

(Source for VoicePod)

Augmentative Communication, Inc. One Surf Way, #237 Monterey, CA 93940

Phone: 831 649-3050, <http://www.augcominc.com>

Autism Resource Network. 904 Mainstreet #100, Hopkins, MN 55343.

(952) 988-0088. (source for Time Timer)

Beacon Ridge 20951 Baker Road, Gays Mills, WI 54631. 1-800-737-8029.

<http://www.beacon-ridge.com>. (MemoBoard & ChalkBoard contact paper, Skishie)

Blackstone, S. (2004). Visual scene displays. *Augmentative Communication New*, 16, 1-16.

Dietz, A., McKelvey, M., Beukelman, D. (2006). Visual scene display (VSD): New AAC interface for persons with aphasia. *Perspectives in Augmentative and Alternative Communication*, 15, 13-17.

Riverdeep, Redmond, WA. 1-800-426-0856. <http://www.riverdeep.net>. (software)

EIKI International, Inc. 26794 Vista Terrace Dr., Lake Forest, CA 92630.

(714) 457-0200. (Source for Language Master)

Enabling Devices. 385 Warburton Ave., Hasting-on-Hudson, NY 10706.

800-832-8697. <http://www.enablingdevices.com>. (Cheap Talk, Go! Board)

Frame Technologies. W681 Pearl St., Oneida, WI 54155.

(920) 869-2979. <http://www.frame-tech.com>. (Voice in a Box and Talk Pad).

Greystone Digital, Hunstville, NC, 1-800-249-5397. <http://www.bigkeys.com>.

Intellitools, Inc. 1720 Corporate Cir., Petaluma, CA 94954.

800-899-6687. <http://www.intellitools.com>. (IntelliKeys, IntelliPics, IntelliTalk).

Lee Products. 800-989-3544. (source for Highlighter tape, no phone retail, but will tell you the retailer nearest you.)

Mayer-Johnson, Inc. P.O. Box 1579, Solana Beach, CA 92075-7579.
<http://www.mayer-johnson.com>. (BoardMaker, PCS, Communicate: SymWriter)

Silver Lining Multimedia, Inc. <http://www.silverliningmm.com>. - Picture This - Pro

Slater Software. 351 Badger Land, Guffey, CO 80820
<http://www.slatersoftware.com>. (Picture It and PixWriter)

Time Timer, Inc. 7707 Camargo Road, Cincinnati, OH 45243 <http://www.timetimer.com> (Time Timer watch and Time Timer Watch Plus)

WatchMinder. PMB #278, 5405 Alton Pkwy #5A, Irvine, CA 92604-3718.
1-800-961-0023. <http://www.watchminder.com>.

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WEB RESOURCES

These websites, unless otherwise noted, are FREE sites

General Autism-Related Resources

<http://www.aspergersyndrome.org> Online Asperger Syndrome Information and Support, OASIS (excellent and extensive resources about Asperger's Syndrome for individuals on the spectrum and their families)

<http://www.autism.org> Center for the Study of Autism (affiliated with the Autism Research Institute)

<http://www.autisminternetmodules.org/> Autism Internet Modules (AIM) – The AIM project will develop a series of 60 modules by the characteristics, evidence-based practices and interventions, transition to adulthood, and employment. Module authors include experts on ASD from across the nation. Information is presented at a universal reading level with activities providing support to those with introductory or advanced knowledge on ASD. These modules are available at no cost to any computer or digital telephone user.

<http://www.autism-resources.com> Autism Resources (collection of links relating to all areas of autism)

<http://www.autism-society.org> Autism Society of America (oldest and most comprehensive autism organization)

<http://www.cdc.gov/ncbddd/autism> Centers for Disease Control and Prevention Autism Information Center

<http://www.firstsigns.org> First Signs (excellent information for early screening and identification including video comparisons)

<http://www.teacch.org> Treatment and Education of Autistic and other related Communication Handicapped Children (THE resource for Structured Teaching information and support)

<http://www.tonyattwood.com> Asperger's Syndrome supports

Sensory

<http://www.alertprogram.com/about.php> An excellent resource on teaching children how to learn to regulate their alert systems

<http://www.comeunity.com> Family focused sensory strategies

<http://www.iidc.indiana.edu/irca/sensory/sensoryintegrate.html> A resource for explaining sensory integration and how it may affect children with autism

<http://www.sensory-processing-disorder.com> Sensory Processing Disorder site with resources

<http://www.sensorysmarts.com> ideas, information, and sample sensory diet

<http://www.sensorysmarts.com/diet.html> Information on sensory diets for at home and away

<http://www.spdnetwork.org> Sensory Processing Disorder Foundation

http://www.stickkids.com/_wsn/page3.html A software program to make sensory diets using visuals of stick figures (fee for the software)

Motor

<http://www.as.wvu.edu/~scidis/dysgraphia.html> Helpful explanation on dysgraphia from Eberly College in West Virginia

<http://autism.about.com/od/whatisautism/a/OTBasics.htm> Explains what an occupational therapist can do for a child with autism to support better motor and sensory functioning

<http://www.hsd.org/Child/Speech/autismdefine.htm> Hearing, Speech and Deafness site explains symptoms in many areas of development (gross and fine motor included) that may affect children with autism

<http://www.polyxo.com/programs/toc-motor.html> A website about a motor curriculum for children with autism including ideas for gross motor, fine motor and oral motor

<http://www.teacch.com/highfunction.html> This section of the TEACCH website focuses on helping students with high functioning autism and has suggestions for handwriting and note taking

<http://tvteachervideos.com/Products.html> Using video, which often appeals to students with autism, this handwriting program is a DVD featuring visuals that children can watch to learn how to form the letters (fee for the software)

<http://www.emints.org/ethemes/resources/S00002359.shtml> Summary and links to handwriting skills for students with autism (fee for some of the programs)

<http://autism.healingthresholds.com/> - Research summaries including research on motor skills

Communication

<http://aac.unl.edu/intervention.html> Visual scene display resource

<http://www.aacintervention.com> AAC Intervention (good overview and ideas for AAC)

<http://aac.unl.edu/yaack/c3.html> Augmentative and Alternative Communication (AAC) Connecting Young Kids (YAACK)

<http://www.aea10.k12.ia.us/divlearn/Assist/adaptstorybk.html> Adapted storybooks and workshop overlays in Boardmaker

http://www.Bcps.k12.md.us/boardmaker/adapted_library.asp Boardmaker files of library collections with questions set up for device overlays—all free downloads

<http://www.bry-backmanor.org/index.html> Downloadable picture symbol recipes

<http://www.designtolearn.com> Design to Learn (Tangible Symbol Systems)

<http://www.dotolearn.com> Downloadable materials and black/white picture symbols—some require fee

http://www.frsd.k12.nj.us/autistic/Social%20Stories/social_stories.htm Social Stories to print out from the Beattie Center for Children with Autism

<http://www.members.tripod.com/trainland/pecs.htm> Downloadable picture symbols and autism links

<http://www.setbc.org> Special Education Technology, British Columbia (many picture sets, social stories and curriculum materials available for download)

<http://www.symbolworld.org> free downloads that have been adapted with picture symbols

Academics

<http://atto.buffalo.edu/registered/Tutorials/talkingBooks/powerpoint.php> Download complete talking books tutorial using PowerPoint 2003

<http://fullmeasure.co.uk/PowerTalk/> To make your story "talk", there is a free program, PowerTalk, available at. PowerTalk—requires PowerPoint 2000 or later to be installed on Windows 2000, XP, 2003 Server or newer

<http://kidzone.ws> Printables for preschool through 5th grade with math, geography, science, language arts, and thematic units

<http://www.carlscorner.us.com> Printables for reading, language, and writing

<http://www.coolmath4kids.com> Interactive math games

<http://www.funbrain.com> Wide variety of academic games and downloads

<http://www.jambav.com> Activities designed for kids on the spectrum

<http://www.preschoolbystormie.com/welcome.htm> Free site—divided by themes

<http://www.senteacher.org> Free teaching and learning resources for students with disabilities; printables and downloads as well as links

<http://www.starfall.com> Lots of interactive reading/writing activities

<http://www.videojug.com/film/how-to-create-a-talking-book-in-microsoft-office-powerpoint-2003> Video for making talking books

Organization

<https://www.google.com/calendar/render> Search the "What's New" features; the calendar can be retrieved anywhere and can be put on a Google Desktop or a Customized Google Homepage, or accessed from a phone

<http://www.google.com/intl/en/googlecalendar/new.html> A link to calendar features.

<https://www.jotlet.net/> Jotlet at a glance has: multiple calendars; color-coded events and tasks; schedule sharing; import, export and sync capabilities; email and SMS reminders

<http://www.writeboard.com> Writeboard is a collaborative writing website where you can write, share, revise and compare

Behavior

http://www.geocities.com/beth_brittney/workingwithfamilies.html “Accentuate the Positive”

<http://www.pbis.org/main.htm> Positive Behavioral Interventions and Supports

<http://www.polyxo.com/fba/> Polyxo: Teaching Students with Autism – good information and data sheets for functional behavior assessments

http://www.ssd.k12.mo.us/Staff/instructional_tools/assets/FUNCTIONAL%20SKILLS.pdf
Functional Skills Support Materials Guide

<http://www.state.ky.us/agencies/behave/homepage.html> The Behavior Home Page

Social Interaction

<http://www.autismnetwork.org> Interactive Collaborative Autism Network

<http://www.autismnetwork.org/modules/social/index.html> Has great information and materials for social skills assessment, and support – also a wide variety of other autism related material

<http://www.dotolearn.com> Good emotion games under “songs and games” plus organization and learning materials

<http://www.sandbox-learning.com> Fee-based website dedicated to the construction of personalized Social Stories for students

<http://www.socialthinking.com> Michelle Garcia Winner’s Social Thinking information and supports

<http://www.thegraycenter.org> Provides information on social stories, comic book conversations and social understanding