CHAPTER 4:
TEACHING THE STUDENT WITH AUTISM SPECTRUM DISORDER

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When teaching a student with ASD there are numerous instructional strategies for the team to choose from. The selection of appropriate instructional strategies depends on the team's knowledge of ASD (Chapter 1), understanding of the student's individual strengths and needs (Chapter 2), and the outcomes identified in the student's educational plan (Chapter 3). Instructional strategies cannot be effectively applied, however, without understanding how a student with ASD learns.

In order to teach a student with ASD a new skill or activity, it is necessary to understand how the student learns. Many students with ASD, for example, need to learn how to learn. The typical learning characteristics of students with ASD, as well as general strategies for teaching, are outlined in Chapter 4.

Learning Characteristics of Students with ASD

As students with ASD display common characteristics of ASD, they also share common strengths and needs in their capacities for learning. Because students with ASD are highly individual learners there will always be some element of trial and error in selecting appropriate instructional strategies, but by understanding the relationship between the primary and associated characteristics of ASD and typical learning strengths and needs, it is possible for the team to identify areas where there are many opportunities for success.

Typical learning characteristics of students with ASD can be identified in the following areas

- strengths and needs
- motivations and interests
- structure, routine, and predictability
- responsiveness to visual support

Strengths and Needs

Students with ASD learn best when educators select instructional strategies that best fit the individual strengths and needs which have been outlined in the student profile. Instruction that focuses on student strengths can provide a means of compensating for areas of student weakness or need, encouraging the acquisition of new skills, and reducing the student's frustration. For example, if reading is a relative strength for a student who does not comprehend spoken language well, then strategies that incorporate print into instruction might aid the development of comprehension skills.

Motivations and Interests

Students with ASD are typically motivated by highly individual and frequently idiosyncratic things. They may not be motivated and rewarded by the same things that motivate other students, such as verbal praise.

Strategies that incorporate specific interests tend to be more motivating than instructional strategies that do not. Students will typically participate in instruction with greater attention and for longer periods of time when engaged in activities they find motivating.

> For a Preference Survey to be used with the student or with parents or other caregivers, see Janzen, J. *Understanding the Nature of Autism*, 2003: 99.
> (Education)

Motivation, the personal reason for doing something, is critical for learning. It may come from within the person (intrinsic) or from outside the person (extrinsic). A motivated student is more likely to

- attend to an activity
- enjoy doing an activity
- stay with an activity longer
- require less prompting and encouragement to complete an activity

Seeking out things that motivate a student with ASD creates the potential for the student to engage in activities and to be more receptive to learning. As an additional benefit, student behaviour is often best when the student is engaged in activities that incorporate individual interests.

Structure, Routine, and Predictability

Students with ASD benefit from structure, routine, and predictability in their lives. Providing structure, routine, and predictability does not imply forcing a student to follow a strict routine imposed by an adult. Rather, the learning environment should be structured to provide an appropriate level of consistency and clarity; students should know where things belong, what is expected of them, and what comes next.

Individual needs and preferences should determine the amount of structure, routine, and predictability each student requires. Some students may require more than others. Also a student may need more structure, routine, and predictability on some days than others. It is important to make adjustments as required.

Visual support is typically the most effective vehicle to communicate structure, routine, and predictability because it offers the student a permanent reminder of expectations. Visual supports can also increase the student's potential to function with greater independence once the routine is established.

Responsiveness to Visual Support

The majority of students with ASD process visual information better than auditory information. Information presented in visual form such as colour photographs, pictures, line drawings, and print offers students more success with comprehension and expression than information presented in other forms.

With visual supports, students can

> For good visuals of students using appropriate behaviours, see
> - Street, A., and R. Cattoche. *Picture the Progress*, 1995. (Social Relationships)
> - Reese, P.B., and N.C. Challenner. *Primary, Intermediate and Adolescent Social Skills Lessons*, 1999. (Social Stories)

examine the information until they are able to process the contents of the message. In contrast, verbal (or gestural) information is transient: once delivered, the message is gone. For students who require extra time to process language or who may not be able to pick out relevant information from background noise, visual supports allow them the opportunity to focus on the message.

Visual supports range in complexity from simple and concrete to complex and abstract; from real objects, colour photographs, colour illustrations, black-and-white pictures, and line drawings to written language. Visual supports can include pictures, books, checklists, schedules, social stories, written instructions, and so on.

> For more examples of the use of visual supports, see
> - Hodgdon, L.M. *Visual Strategies for Improving Communication*, 1995.
> - Hodgdon, L.M. *Solving Behaviour Problems in Autism*, 1999.
> - Bondy, A., and L. Frost. *A Picture's Worth*, 2001. (Visual Strategies)
> - Janzen, J. "Organize and Structure Visual Support Systems." *Understanding the Nature of Autism*, 2003: 197-229. (Education)
> - Myles, B.S., and D. Adreon. Table 4.3 "Visual Supports for Middle and High School Students with AS." *Asperger Syndrome and Adolescence*, 2001: 87-91.
> - Moore, S.T. "Visuals." *Asperger Syndrome and the Elementary School Experience*, 2002: 53-99. (AS)

Visual supports can be used to

- *organize student activities* (for example, daily schedules, mini-schedules, activity checklists, calendars, choice boards)
- *provide directions or instructions* (for example, visual display of classroom assignments, file cards with directions for specific tasks and activities, pictographs and written instruction for presenting new information)
- *assist in illustrating the organization of the environment* (for example, signs, lists, charts, messages, labeled objects and containers)
- *support appropriate behaviour* (for example, posted rules and representations to signal steps of routines)
- *teach social skills* (for example, pictorial social stories which depict specific social situations and demonstrate appropriate social cues and responses)
- *teach self-control* (for example, pictographs that provide cues for behaviour expectations)

Students who use visual support are more likely to reach their potential as verbal language users than those who do not. In addition, students with ASD who are verbal typically continue to benefit from visual support because it provides useful supplementary information, which helps to compensate for difficulties in attention and language comprehension. Concerns about visual support hampering the development of verbal language often limit its use. There is no research to indicate that visual support impedes language acquisition.

> For downloadable visual symbols and photos, try
> <www.usevisualstrategies.com>
> <www.do2learn.com>
> <www.card.ufl.edu/visual.html>

General Instructional Strategies

A wealth of instructional strategies is available for students with ASD. Ultimately, effective instructional strategy selection depends on knowledge of ASD and the individual student. The effectiveness of any particular strategy is best determined by the progress of individual students toward achieving their determined outcomes.

The strategies in this section reflect the primary characteristics and associated features of ASD and the well-documented learning styles of students with ASD. The selection of instructional strategies, however, does not need to be restricted to specific categories or particular settings. One instructional strategy may be used in a number of ways. For example, a daily schedule may be used to provide structure, routine, and predictability; teach new vocabulary; develop expressive language skills; reduce anxiety resulting from change; and so on.

In addition, most of these instructional strategies are as appropriate for use in the home or community as they are in educational settings. With some minor adjustments, most strategies can be tailored to fit a variety of settings. Using the same strategy in a number of settings may have important benefits, including a generalization of skills which can be applied between one setting and another and the development of communication between home and school.

> **Please note:** Strategy selection must be guided by the qualifications and expertise required to implement the strategies. For example, in most cases, educational assistants will require specific training and ongoing supervision when they work with students. If a team determines that consultation is required concerning the selection and implementation of specific strategies, it should involve the appropriate professional.

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- **Task Analysis**

  Task analysis can be used to teach a wide range of skills to a student with ASD. It involves breaking complex tasks down into smaller sub-tasks. These smaller, more manageable steps may then be taught and reinforced in sequence, allowing the student to learn the larger, more complex task. If the student continues to have difficulty with smaller steps, they can be broken down into even smaller steps. For example, a task analysis of a social skill such as asking a peer to play may be broken down into small steps to facilitate student learning.

Task Analysis: Asking a Peer to Play

STUDENT'S NAME: _____

TASK: ___Asking a peer to play_____

Date													
Identify peer who is not currently play-ing with anyone													
Identify activity to play													
Approach peer													
Gain peer's attention by saying name or tapping him or her on the shoulder													
Establish eye contact with peer													
Ask peer if he or she would like to play													
Commence activity if peer agrees to play, or approach another peer													

A blank Task Analysis form is available in Appendix F: Forms.

- **Break Verbal Instructions into Small Steps**

    Avoid long strings of verbal information when providing instruction for students with ASD. Supporting verbal instruction with visual cues and representation will help students comprehend material and understand expectations.

    > See Janzen, J. "Organize and Structure Verbal Information." *Understanding the Nature of Autism,* 2003: 230-244. (Education)

- **Discrete Trial Methods**

    When using discrete trial training, the instructor presents the stimulus for the desired behaviour (i.e., gives the directions or instructions) and prompts the student; the student responds and then the instructor provides a consequence (something that increases the frequency of the desired behaviour or reduces the frequency of undesired behaviour). Using prompts is an important element of instruction for some students with ASD. Prompts may be physical, gestural, or verbal. They should only be used as long as they are needed, as students can become dependent on prompts. The prompt

    > For a comprehensive discussion of the history and strategies to implementation of Applied Behavioural Analysis (ABA), see the summer 2001 special edition of *Focus on Autism and Other Developmental Disabilities* 16(2). (ABA)

    > For software modules with discrete trial methods for teaching many different skills, see <www.dttrainer.com>

is often designed to model the desired behavior or assist the student in performing it.

Here is an example of a discrete trial method.

Outcome: Identify numbers given a verbal direction: Jackie will touch the card representing the correct number four out of five times when presented with cards with the numbers 1, 2, 3, 4, and 5 on them.			
Stimulus	**Instructor Prompt**	**Student Response**	**Consequence**
Instructor says, "Touch 5."	Instructor taps the card with #5 on it.	Student touches the card with #5 on it.	Instructor smiles and says, "Good work, Jackie."
Instructor says, "Touch 5."	Instructor points at card with #5 on it.	Student touches card with #3 on it.	Instructor turns head and makes no verbal response.
Instructor says, "Touch 5."	Instructor taps the card with #5 on it.	Student flaps hands.	Instructor turns head and makes no verbal response.
Instructor says, "Touch 5."	Instructor points at card with #5 on it.	Student touches the card with #5 on it.	Instructor smiles and says "Good work, Jackie."

(Adapted from Leaf, R., and J. McEachin, eds. *A Work in Progress,* 1999.)

Please note: It is important to distinguish between Applied Behavioural Analysis (ABA) as a general term that refers to a collection of teaching strategies based on behaviour modification, and intensive ABA programming intended for young children with ASD. Intensive ABA programming involves ABA strategies and techniques applied under the supervision of a qualified professional, a significant number of hours devoted to therapy per week, and involvement by family members in the therapy process. In Manitoba, early intensive ABA is provided through St. Amant Centre.

> Please see the Manitoba Education, Citizenship and Youth website for links to this and other services for children and students with ASD: <www.edu.gov.mb.ca/KS4/specedu/aut>

- **Prompt Hierarchies**

    Prompts are the cues or reminders used when training a student toward a desired behaviour. The term hierarchy is used to rank prompts from most intrusive to least intrusive. Understanding prompt hierarchies helps to avoid teaching a student with ASD to become over-dependent on prompts. Table 4.2 illustrates a prompt hierarchy.

Table 4.2: Prompt Hierarchy

Stimuli	Level of prompt	Behaviour	Consequence
Tape recorder is available in the school for student's use; music has been determined to be a favourite activity for the student; student has free time.	8-Natural	Without prompting, and given free time and the presence of the tape recorder, student turns on tape recorder.	Student listens to music.
	7-Gestural	Adult points toward tape recorder; student turns on tape recorder.	Student listens to music; adult may nod approval.
	6-Indirect verbal	Adult says, "Why don't you listen to music?" Student turns on tape recorder.	Student listens to music; adult says, "Good idea!"
	5-Direct verbal	Adult says, "Turn on the tape recorder." Student complies.	Student listens to music; adult may verbally reinforce for turning on tape recorder.
	4-Model	Adult models turning on tape recorder for student, then gives student a turn to do so.	Student is reinforced for attending to model, and gets to listen to music when he turns tape recorder on himself.
	3-Minimal physical	Adult points student in direction of tape recorder and pushes student's hand toward tape recorder if necessary; student turns on tape recorder.	Student listens to music; adult may need to provide additional verbal praise.
	2-Partial physical	Adult positions student's hand on tape recorder button, but releases hand so student can press it.	Music may be enough, but student may require additional verbal or object reinforcement.
	1-Full physical	Adult physically assists the student's hand through the turning on of the tape recorder.	Again, music may be sufficient, but additional reinforcement may be necessary.

- **Encourage Independent Effort and Incorporate Proactive Measures to Reduce Potential Prompt Dependence**

  Students with ASD who are constantly prompted may not reach their potential for independent action. Since independence is a desired outcome for all students, instruction should incorporate strategies such as those below to decrease the potential for prompt dependence.
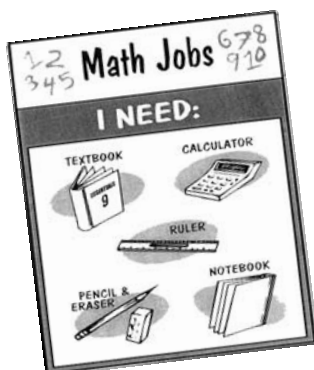
  – Use visual aids to decrease reliance on physical and verbal prompts.

  – Use peers to support independence.

  – Plan ways to fade prompts.

  – Provide visual organizational aids, such as schedules, task outlines, checklists and charts, and involve the student in developing and implementing them, if feasible.

  – Provide instruction to increase the student's awareness of environmental cues (for example, preparing the student for the ringing of a school bell at recess).

> For a discussion of using prompts and cues, see Janzen, J.E. "Teach New Skills." *Understanding the Nature of Autism*, 2003: 245-269. (Education)

Math Jobs: Reproduced from *Teaching Students with Autism: A Resource Guide for Schools.* © 2000 British Columbia Ministry of Education.

– Teach in an environment that remains consistent, using consistent environmental cues.
– Ensure that adults are not always positioned too close to the student and that more than one adult has contact with the student.
– Reward on-task behaviour.

A note on reducing prompts: These strategies are intended for situations in which the student is ready for some independent function. Decisions about when to incorporate these strategies and whether they are achieving the desired outcome should be based on how the student responds.

- **Behaviour Shaping**

  Students with ASD often need assistance to develop behaviours that are not already part of their repertoire of skills. Behaviour shaping as a teaching strategy is a way of helping students develop desired new behaviours. First, the target behaviour is identified and the student's closest approximation to that behaviour is reinforced. If prompts are used, they should be of the least intrusive level and faded as quickly as possible. Gradually, expectations for performance are increased and only responses that more closely approach the target behaviour are reinforced.

  > For a discussion of behavioural strategies, see
  > - Harris, S.L., and M.J. Weiss. *Right From the Start*, 1998. (ABA)
  > - Janzen, J. "Critical Instructional Strategies." *Understanding the Nature of Autism,* 2003: 247-269. (Education)
  > - Sundberg, M.L., and J.W. Partington. *Assessment of Basic Language and Learning Skills*, 1998. (ABA)

  This is a formal use of a strategy often used naturally by parents whose child is just beginning to communicate. For example:
  – The child reaches toward a pitcher of juice.
  – The parent pours some and says "juice."
  – The child says "j" and receives the juice.
  – The parents repeat the prompts on other occasions.
  – Gradually, the child's ability to imitate and articulate improves, until the child is able to repeat the word "juice" and then say "juice" without a parental prompt.

- **Use Meaningful Reinforcement**

  A reinforcer can be anything, from praise to tangible objects, that increases the frequency of a behaviour. Students with ASD may not be motivated by common reinforcers that work with other students. They might instead prefer having some time alone, taking a trip to the cafeteria, going for a walk, having an opportunity to talk with a preferred adult, listening to music, performing a favourite routine, or playing with a desired object that provides specific sensory stimulation.

A list of preferred activities and reinforcers can be developed for a student with input from his family and others who know the student well. These reinforcers can then be used to motivate the student to learn new skills.

Table 4.3 contains a list of sample reinforcers.

Table 4.3: Sample Reinforcers

For students who like:	Sample Reinforcers Available in School Environments
• to read or be read to	• hearing a few pages of an exciting book after a task is completed, or reading it alone • listening to taped books or viewing CD-ROM stories • listening or watching a tape of themselves reading • dictating while someone scribes or keyboards their words or phrases • having access to particular books available to them only after a particular task
• to draw	• copying line drawings or illustrations on topics of special interest • illustrating daily schedules or social stories • colouring a part of a picture each time a task is completed until the whole drawing is coloured • illustrating posters for the library and so on • using special art materials or paper • colouring photocopied drawings, dot-to-dots, or mazes
• to use mechanical skills	• playing with cause-and-effect toys • having access to materials which can be put together, including construction blocks, etc. • building models, especially ones with moving parts • reading books or watching videos or CD-ROMs that explain how things work
• to be in control	• getting to choose activities or order of tasks • being the caller, instruction-giver, cue-giver, or "banker" in games such as Lotto™, Junior Monopoly™, or guessing games • ringing an old-fashioned bell at the school door to signal other students to come inside • being a "detective" by decoding a message or reading questions on cards and then looking for the answer • making Trivial Pursuit™ style questions for classmates on a classroom unit or on a topic of their choice • doing worksheets that require finding and correcting errors
• to socialize or engage verbally with adults	• "checking in" frequently with teacher or educational assistant, verbally or non-verbally • discussing topics of their choice with people of their choice during scheduled times of the day • being involved in non-academic tasks with favourite adults, such as setting up and taking down gym stations, shelving library books, unpacking and storing supplies, tidying up staff room, helping Kindergarten teacher with classroom maintenance, etc. • participating in activities that involve traveling around the school and interacting with many people, such as collecting recycling or call-back sheets, delivering materials to classrooms, etc.

- **Provide Precise, Positive Feedback**

   Give students precise information about what they do right or well (for example, "Great colouring" or "Good finishing of that math problem.") Generalized praise may result in unintended learning that is hard to reverse. Students with ASD may learn in one trial, so directing the praise to the very specific target behaviour is important. Accidental

learning can occur if the student mistakenly connects something he is doing with the reinforcement he receives. Saying "Sal, you are doing very well at multiplying those numbers" directs attention to the activity of multiplication; saying "Sal, you are doing very well" when Sal is also swinging his feet while he does the math assignment might connect the feet swinging with the general praise.

- **Pace Tasks at Student's Level**

  Students with ASD often need more time to process information than typically developing students. Providing extra time to complete activities and allowing for an appropriate amount of time between instructions and expected responses gives students with ASD greater opportunity to succeed at their tasks.

- **Plan and Present Tasks at an Appropriate Level of Difficulty**

  Students with ASD may be particularly vulnerable to feelings of anxiety and frustration if they cannot perform assigned tasks. Increasing the level of difficulty gradually and providing the necessary learning supports (particularly with visual information rather than solely verbal explanations) will enable the student to develop skills and will assist in minimizing the student's frustration.

- **Use Concrete Examples and Hands-On Activities**

  Students with ASD learn by seeing and doing. When possible, try to use a concrete example to supplement oral instructions. For example, in demonstrating a project such as making a Father's Day card, show the student what the finished product might look like while explaining the

  > For resources to support hands-on learning in teaching concepts, see Mulstay-Muratore, L. *Autism and PDD: Abstract Concepts*, Level 1 and Level 2, 2002.
  > (Education)

  steps in how to make it. Teach abstract ideas and conceptual thinking using specific examples, and vary the examples so that the concept is not accidentally learned as applying in only one way.

- **Introduce New Tasks in a Familiar Environment when Possible**

  Students with ASD often resist attempting new activities or learning new skills. When introducing something to a student with ASD for the first time, it is often helpful to do so in a familiar environment. When it is not possible to introduce unfamiliar tasks in a familiar environment, supports such as pictures, videotapes, or social stories may help prepare the student for the task.

- **Plan for Transitions**

    Students with ASD frequently have difficulty with the unknown and fear the unpredictable. As a result, transitions are often difficult and may result in increased anxiety and inappropriate or resistant behaviours. Transitions for students with ASD should therefore be carefully and thoughtfully planned.

    > 💡 For a detailed transition checklist and discussion, see Myles, B.S., and D. Adreon. "Setting Demands" (46-49) and "Transition Planning for the Student with Asperger Syndrome" (121-135). *Asperger Syndrome and Adolescence*, 2001.
    > (AS)

    Whether the student is moving between classrooms, schools, or different areas in the same room, it is a good idea to prepare the student well in advance of the change. It is also important to prepare any people who may be receiving the student. Transition issues are generally similar regardless of whether the transition is large or small; however, additional time and preparation may

    > 💡 For a discussion of post-school transitions, see Myles, B.S., and R. Simpson. "Planning for Life after School." *Asperger Syndrome: A Guide for Educators and Parents*, 1998: 97-113.
    > (AS)

    be necessary for larger transitions. If a student is moving between classrooms, for example, he will need to get used to a new room and possibly new people; if he is moving between schools he will need to adjust to a whole new building and its rules and expectations.

- **Use Consistent Cues or Routines to Signal Transitions**

    When cues or routines are consistently repeated, it becomes easier for a student with ASD to become familiar with a schedule, anticipate new activities, and prepare for making transitions. For example, if a student hears the same song before a certain activity every day, he may begin to associate that song with stopping what he is doing and moving to the area where the new activity will take place. The words "almost done" may

    > 💡 See Janzen, J.E. "Organize and Structure Events in Time" (178-186), and "Organize and Structure Events as Routines" (188-194). *Understanding the Nature of Autism,* 2003.
    > (Education)

    become a cue that the present activity is nearly finished and a new one will begin soon. Cues and routines become familiar with repetition.

- **Schedules**

    Schedules provide a visual means of outlining events that will take place in a morning or afternoon, or in a day, week, or month. The schedule allows students with ASD to anticipate what will happen in a given space of time, which can improve the student's ability to make transitions as well as reduce his anxiety.

LACEY'S SCHEDULE

PERSONAL CARE
CALENDAR
READING
COMPUTER
RECESS
MATH
35
+21
56
LUNCH
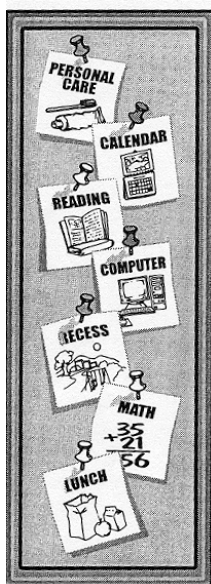
Lacey's Schedule: Reproduced from *Teaching Students with Autism: A Resource Guide for Schools.* © 2000 British Columbia Ministry of Education.

- **Checklists**

  Checklists describe in step-by-step fashion what students need to do to complete a task. Students with ASD often experience difficulty with processing oral instructions and sequences. Checklists offer students a "roadmap" through a task or activity, allowing them to navigate an assignment without getting lost. The use of checklists promotes independence.
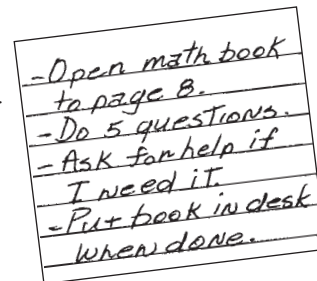
- **Provide Opportunities for Choice**

  Students with ASD often have a limited ability to communicate, and strategies for providing choice will need to be developed on an individual basis. Regardless of which strategies are used, it is essential that the student learns how to make choices. Many parts of the student's life may necessarily be highly structured and controlled by adults, and he may not have many opportunities for making choices. Sometimes a student consistently chooses one activity or object because he does not know how to choose another.
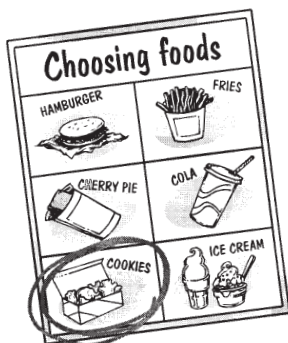
 Until the student grasps the concept of choice, choices should be limited to preferred and non-preferred activities. More elaborate choices can then be presented. Open-ended choices (for example, "What would you like to drink?") will not help to develop the student's skill at making choices, and instead may be a source of anxiety and/or frustration. A more successful strategy would involve asking the student whether he prefers orange juice or milk, for example.

  See Hodgdon, L.M. "Making Choices and Requests" (125-138) and "Protest and Rejection Skills" (139-150) in *Solving Behaviour Problems in Autism*, 1999. (Visual Strategies)

- **Choice-Making Tools**

  Students with ASD often experience difficulty with choice-making. Materials such as choice boards will help students develop choice-making skills in a motivating and natural context. The symbols and layout of choice boards can be adjusted according to individual levels of ability.
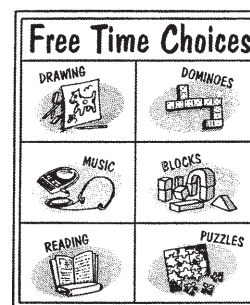
- **Highlight Important Information**

  The ability of students with ASD to focus on important information may be affected by a number of factors, including environmental distractions, a lack of interest in the material, or an inability to interpret cues that emphasize key pieces of information. As a result, time can be wasted and learning opportunities may be lost.

Choosing Foods, Free Time Choices: Reproduced from *Teaching Students with Autism: A Resource Guide for Schools.* © 2000 British Columbia Ministry of Education.

It is essential to be aware of whether students with ASD are able to focus on critical information. It may be necessary to help them identify what is important by

– using a highlighter marker to identify key words or concepts
– providing summaries (written or pictorial) of lessons or concepts
– providing questions to develop reading comprehension

• **Organize Teaching Materials and Situations to Highlight Information**

Visual aids and environmental organization can help a student attend to pertinent information. Remove extraneous materials from the desk or table before attempting to teach a new skill. Present only the text the student will read, rather than the whole book.

• **Post Classroom Rules**

Classroom rules can be outlined in brief statements or illustrations that provide concrete information about

– structure and routines of the classroom
– personal space
– required behaviour (for example, raising hand)
– movement within the classroom
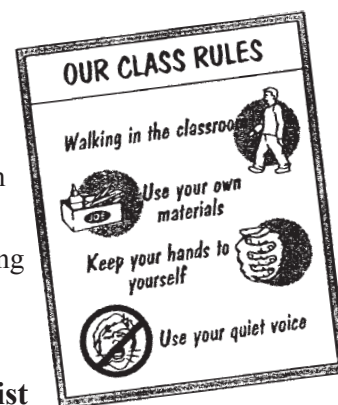
• **Know the Student and Maintain a List of Strengths and Interests**

Family members and caregivers can provide valuable information about what a student knows and does at home or in the community. Educators likewise can provide information about the student's strengths and interests in school. Together, these interests and strengths can be incorporated into instruction and used for reinforcing successful learning and appropriate behaviour.

• **Develop Talent and Interest Areas**

If a student with ASD demonstrates a particular interest and/or strength in a specific area (for example, music, drama, art, graphics, computer), provide opportunities for him to develop further expertise in that area. The ability to develop and indulge in talents and interests not only provides enjoyment for the student, it creates opportunities for success, strengthens existing skills, and improves confidence, all of which contribute to a strong foundation for building new skills.

> For articles by Temple Grandin regarding developing talents and helping students with ASD choose the right job and manage the transition to the world of work, see <www.autism.org/temple/jobs.html>

Our Class Rules: Reproduced from *Teaching Students with Autism: A Resource Guide for Schools.* © 2000 British Columbia Ministry of Education.

> Waylon is a Grade 5 student with ASD who is extremely interested in computers; he shows little interest in interacting with his classmates and resists written assignments.
>
> The students in Grade 5 use the *New Word Game* as a strategy to construct and confirm meaning during each novel study. Before reading, each student writes down a word for which he or she does not know the meaning; after reading, he or she looks in the dictionary and writes the meaning that fits the context of the story. The students then challenge each other to provide the correct meaning for each word, and post words that no one can define on the bulletin board.
>
> Waylon's teacher has put him in charge of the *New Word Game* database. After each chapter, Waylon is given time to update the class database with words he and his classmates have defined; he is also responsible for helping his classmates if they have difficulty accessing the database and helping them develop their own databases.

- **Direct and Broaden Interests into Useful Activities**

  The repetitive patterns of behaviours, interests, and activities that are a primary characteristic of ASD may be incorporated into instructional activities. Incorporating a student's interest into instructional strategies may increase his attention and help to facilitate learning.

Teaching the Student with ASD How to Learn

Many students with ASD need to learn how to learn before they can begin acquiring new skills. All students with ASD have individual learning preferences, strengths, and interests, but they often share certain areas of need which must be developed in order for them to participate in the learning process. Once these individual areas of need have been identified, the general strategies described above can be used to strengthen and develop these areas. Only then will the student with ASD be prepared for successful learning, and the general strategies described above can be applied to the teaching of new activities and skills.

In order to help the student with ASD develop these fundamental skills, it is important to get to know the student, develop a relationship, and earn the student's trust.

The characteristic learning needs of students with ASD can be strengthened by

- connecting actions with specific reinforcers
- teaching interaction
- teaching joint attention and focus
- teaching imitation
- teaching waiting before acting

A reinforcer is something that follows a behaviour and increases the likelihood that it will happen again. To be effective, a reinforcer must be something the student with ASD wants and enjoys. A student with ASD can enjoy many things (for example, food, drink, sensory experiences). He may need to be taught to connect a behaviour or action to a specific reinforcer.

Connecting Actions with Specific Reinforcers

Typically developing students learn to connect actions with reinforcers by exploring their physical and social environment. They learn to repeat actions associated with pleasant consequences and avoid those associated with unpleasant consequences. They understand that their actions can elicit verbal and non-verbal expressions of pleasure or displeasure from other people.

Many students with ASD explore their environment in limited ways and do not learn to connect actions with specific reinforcers effectively. They may not understand non-verbal and verbal expressions of pleasure from adults, or they may relate them to actions of their own. They may learn a repertoire of challenging behaviours because those behaviours lead to predictable adult responses.

- Leaf, R., and J. McEachin, eds. *A Work in Progress*, 1999.
- Martin, G., and J. Pear. *Behavior Modification*. 4th ed., 1992. (ABA)

To connect an action to a specific reinforcer, a student with ASD must learn that *first I do this and then I get that*. When the student understands the *first this/then that* connection, it will be possible to teach him more effectively. In the diagram below, activities (the boxes) are followed by reinforcers (the R) to illustrate how to develop the *first this/then that* connection for students. When an activity has been completed and the student has been reinforced, the materials are put in the "Done" container and the next *first this/then that* connection is attempted.
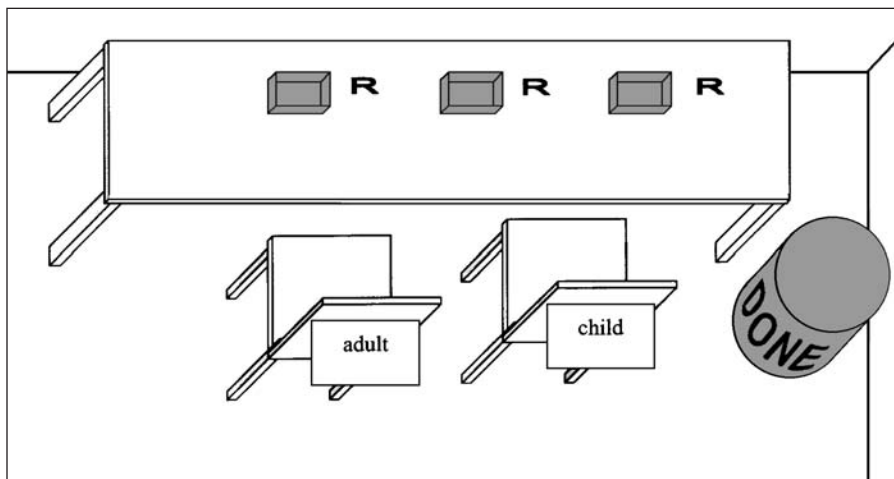
For students with a small repertoire of activities and limited willingness to work within an adult-directed routine, the structured teaching approach developed by TEACCH in North Carolina can be used, as in the following example.

Six-year-old Jana has ASD and significant mental retardation. She has very limited language comprehension and is non-verbal. She has no experience in a classroom environment, and resists interference with her agenda of roaming, by falling to the floor or running and throwing a tantrum.

Reinforcers identified from observation are

- sweet cereal, potato chips, grapes
- stacking up objects and knocking them down
- rhythmic rock music
- inserting objects into small spaces
- deep pressure to shoulders

The teaching routine developed for part of her day is as follows:

- Key staff person spends time in relationship-building activities so that Jana trusts her and sees her as a source of concrete and social reinforcers.
- Adult shows Jana photo of "Work Time" table in visual schedule and takes her to it.
- Adult seats Jana at table against wall, and sits next to her.
- Adult shows Jana material in container (simple block pattern card and blocks), models its use, and points to a pile of blocks next to container, using "first/then" words and signs.
- If necessary, adult provides hand-over-hand support so Jana completes task.
- Adult quickly tries to get eye contact, smiles, says "good," squeezes Jana's shoulders firmly, and points to reinforcer. Adult lets Jana stack up and knock down blocks for two or three minutes after setting timer.
- Adult warns "almost finished" with words and sign, and then "finished" when timer rings. Adult puts all materials away quickly.
- Adult returns Jana to visual schedule, shows "Work Time" is finished, and shows a picture for next activity.
- See <www.teacch.com> for information on structured teaching and articles on educational and communication strategies.
- For more workstation information and printable symbols and photos of workstations, see <www.members.aol.com/Room5>.

The adult gradually expands "Work Time" by adding more containers and more tasks in containers, and making the tasks in containers more complex or time-consuming. Tasks are chosen because they address motor, imitation, or readiness skills in Jana's IEP, and use materials that she already likes.

As Jana masters activities that she enjoys, access to them can be used as a reinforcer for new skills that are harder or less naturally reinforcing.

Teaching Interaction

Students with ASD need to learn to recognize and value other people's positive social responses. The attention and approval of another person can become a powerful social reinforcer that helps the student attend to his environment and co-operate with adult expectations.

Students with ASD need to learn that

- at least one key adult will be able to interpret them to the outside world, and the outside world to them
- the adult can be more than a useful tool
- interaction with other people can be fun and enjoyable

For students who are not well-bonded to key adults at school and who have few activities they enjoy, it is important to set aside times in the day when the agenda is to have fun and engage in activities that allow the student to associate pleasure with the adult's company.

Teaching Joint Attention and Focus

Joint attention is a skill acquired early in the life of a typically developing child. Joint attention occurs when the child is able to follow the gaze of another person to the object the person is looking at. This skill is critical for the development of both language and social communication skills because it helps the young child connect the adult's actions and words to the object being named. Without this connection, language is difficult to learn. As the child gets older, more sophisticated joint attention skills, such as pointing and shared eye contact, are acquired. These more sophisticated skills contribute to increased language learning.

Many students with ASD do not acquire joint attending skills as young children and, as a result, engaging in eye contact and joint attention is difficult for them. Sharing information with another person using eye contact may be a source of confusion and anxiety for a student with ASD. To reduce this confusion and anxiety, students with ASD may avoid eye contact with people in their environment and lose many opportunities for learning new skills (in particular, social and communication).

Students with ASD who have poor comprehension of language, especially of concepts and abstractions, often miss large parts of instruction while trying to process other parts. Some students who are very distractible and/or have sensory sensitivities need to use a lot of emotional and physical energy to cope with overload and to attend to instruction.

Stressors can include

- the need to attend to and process visual and auditory input simultaneously
- the need to process language that is too abstract, has multiple possible meanings, is figurative, or is shaded by emotional tone or non-verbal communication
- the need to adjust to different physical settings and to different adults many times daily
- tactile discomfort created by room temperature, clothing, paints, playdough
- strong smells from the science or art room, lunchroom, pizza or popcorn days, chemicals used to clean, perfumes, and cosmetics

- close physical proximity to peers in groups, lines, gyms, near lockers
- sounds or noises beyond student's control in classrooms, hallways, bathrooms, gym, assemblies, dances; bells and fire drills; clicking fluorescent lights; bubbling fish tanks

Exhaustion from trying to screen distractions and pay attention may be the cause of irritability, outbursts, or complete shutdowns in students with ASD, especially as the day progresses. Information in the Autism Spectrum Disorder Inventory (Appendix D) can be used to assess the degree to which this applies to the individual student, and decide what strategies might work to engage and regain attention.

> For a discussion of preliminary research into relationship-focused intervention with children with ASD, see Mahoney, G., and F. Perales. "Using Relationship-Focused Intervention to Enhance the Social-Emotional Functioning of Young Children with Autism Spectrum Disorders." *Topics in Early Childhood Special Education*, 2003: 77-89.
> (Social Relationships)

Some suggestions:

- let the student look first and listen later, or look/feel/manipulate first and listen later
- experiment with a fiddle object in the student's pocket (or clipped to a belt or attached to a desk)
- keep the student's work area uncluttered
- organize material on the blackboard neatly, with straight lines and ample blank space to minimize distractions
- give the student frequent movement breaks to keep stimulation at an optimum level
- help the student learn to tolerate noise, touch, and proximity with others
- let the student wear earplugs or earphones in class to muffle noise
- break tasks into smaller chunks and reinforce more frequently
- develop an "alerting" signal to tell the student when to pay close attention
- use verbal and gestural "highlighting" to flag important material
- incorporate materials or topics of perseverative interest into instruction
- provide a low-stimulation area for seatwork, such as a carrel or a desk facing a blank wall
- teach the student to recognize overload and ways to screen distractions
- plan proactive ways for the student to indicate when he is overloaded (for example, with verbal language, printed words, or pictures he can point to)

> For information on relationship development intervention, see
> - Greenspan, S.I., and S. Wieder. *The Child with Special Needs*, 1998.
> - Gutstein, S. *Autism Asperger*, 2000.
> - Gutstein, S., and R. Sheely. *Relationship Development Intervention with Young Children*, 2002.
> (Early Development)

> **A note on setting:** The more distractible and impulsive the student, the more important it is to minimize distractions and maximize the chances of successful learning and effective reinforcement.

Very distractible and distracting students may need to spend some of their learning time in a setting that provides

- minimal distractions
- maximum ability for adults to contain the student in one place for table-top activities, and to manage challenging behaviours when they occur

> For a review of one relationship-focused intervention model, see "The Effectiveness of Relationship Development Intervention to Remediate Experience-Sharing Deficits of Autism-Spectrum Children" at <www.connectionscenter.com>.

Teaching Imitation

Typically developing students learn many skills by watching and spontaneously imitating others, whether the activity is using a spoon, naming the letters of the alphabet, or operating a VCR. Many student with ASD have poor spontaneous imitation skills because they tend to experience difficulty with

- eye-hand or bilateral coordination
- motor skills
- motivation
- attending

In order for a student with ASD to learn how to learn, or learn new skills, it is critical that the student is able to attend to gestures and demonstrations, and watch and imitate what they see. For many students with ASD, especially those with poor auditory skills, "watch and imitate" will be the primary avenue for lifelong learning of motor, self-help, and vocational skills.

A Step-by-Step Process for Teaching Imitation

- choose a distraction-free environment
- use visual/auditory/tactile strategies to get the student's attention
- let the student look at, touch, and manipulate materials to satisfy the need to touch and explore, and to feel less anxious about the newness
- move materials out of reach and use consistent verbal/visual cues such as calling the student's name, pointing to eyes and saying "watch"
- if the student is impulsive, try to get "quiet hands" by having the student sit on his hands or grasp a chair (or whatever curbs grabbing behaviour)
- do a one-step action quickly, such as stacking one block on another or drawing a line to connect two dots
- give the student material and let him first try on his own
- if the student does not produce the desired response, try again with hand-over-hand support if required

- praise and reward any success
- be sure the concept of "being finished" is clear to the student (for example, if drawing lines with a marker, have five markers in the container, and discard them one by one after using them. When there are no markers left, the task is finished)
- gradually fade prompts and make imitation tasks more complex

Students with ASD can also practise imitation in casual situations and settings by imitating activities such as throwing bean bags through hula hoops, for example.

If a student is learning to imitate actions required to finish a project, the student may need to see the project finished first and/or watch the steps of the process several times before understanding what is expected. Experiment to see what works.

Teaching Waiting before Acting

Some students with ASD may act impulsively in a teaching situation by performing a behaviour before instructions are completed. For those students, learning to wait before acting will increase their potential to learn new skills.

Activities that require the student to listen and repeat simple instructions before acting (if communication skills allow), watch before acting, or complete some kind of task before acting will help the student learn to wait. Examples of such activities include

- adding particular shapes to a construction of poly-octons or construction blocks
- imitating patterns with a variety of colours, shapes, and objects
- following verbal or written direction to find objects; following instructions that increase gradually in complexity
- watching a bubble float to the floor before stamping on it
- watching a flashlight beam travel and stop on a particular object before the object is taken or named
- counting to a specified number before initiating an action (running, shooting a basketball, pushing a truck)

For more suggestions for students who are distractible and impulsive, see
- Dornbush, M.P., and S.K. Pruitt. *Teaching the Tiger*, 1995. (Related Disabilities)
- Rief, S.F. *How to Reach and Teach ADD/ADHD Children*, 1993. (Sensory/Self Regulation)

Note: If possible, with all of these activities, have the student reverse roles and be the initiator.

Teaching a New Skill or Activity

Once the team has progressed through the multi-step process of understanding ASD, getting to know the individual student, identifying learning outcomes, acquiring knowledge of general instructional strategies to teach a student with ASD, and preparing the student to participate in the learning process, the team is in a position to attempt to teach a variety of new skills or activities.

Learning new skills and activities is important for a student with ASD because it offers the potential for greater independence, increased opportunities for social interaction, and a more meaningful school experience. The more new skills or activities a student is able to learn, the greater the benefit.

A student with ASD may experience difficulty learning new skills for a variety of reasons. For example, a student with ASD may

- resist anything new
- be unable to focus attention
- have difficulty watching and imitating
- not connect actions to reinforcers
- be so interested in a part of an object (for example, the spinning wheels on a scooter board) that he is unable to learn how to use the object in a functional way
- have fine and gross motor difficulties that interfere with performing certain skills

> For suggestions to teach activities to children with beginning skills, see
> - Hannah, L. *Teaching Young Children with Autistic Spectrum Disorders to Learn*, 2001.
> - Leicestershire County Council, and Fosse Health Trust. *Autism*, 1998.
> (Early Development)

A Process for Teaching a New Skill or Activity

The process for teaching a new skill or activity is as follows:

1. observe the student
2. prioritize and prepare
3. teach the new skill or activity

1. Observe

Observe the student in an environment with many choices for activities. This may need to be a self-contained area out of the classroom. Even older, more able students with good school, computer, and communication skills may have a limited repertoire of activities and difficulty learning new ones. Provide activities designed to appeal to much younger students as well as to their chronological age group.

Some Questions to Ask

- What activities does the student enjoy (visual, auditory, tactile, gross motor)?
- How does he explore?
- Does he try to get adult attention or approval? How?
- What kind of adult interaction works best (quiet/animated, verbal/non-verbal?)
- Does he choose age-appropriate activities or those for younger children? Can he watch and imitate others' actions?
- What sensory sensitivities does he show?
- What are possible primary reinforcers (for example, food or drink)?
- Does he understand "first/then" (doing something to get something he likes)?

2. Prioritize and Prepare

At this Stage:

- Choose an activity or skill to teach.
- Break it into small, manageable parts.
- Select materials that motivate the student.
- Select reinforcers.
- Select the most appropriate environment for teaching.

Note:

- Since most students with ASD will take longer to learn and hence can't learn everything we would like to teach, choose activities that will be the most useful to them in the future.

  For example, for students who like to be active but don't have good motor abilities, developing skills with balls, from rolling or bouncing playground balls to shooting baskets or kicking a soccer ball, will also give them a way of socializing with their peers.

  Another student who is older, with good verbal skills but weak motor and social skills with partner activities, might benefit from learning to play familiar card or board games that can later be done with peers.

  For a very distractible student or one with weak motor skills, a beginning activity might be to drop one block into a large coffee can, or to push down once on a top and watch it spin. For a student with more advanced skills, a beginning activity might be a Marbleworks™ type construction game or a board or card game.

- It may be necessary to work in a small room with a door, or at least an area that can be partitioned. For table-top activities, arrange a table with two chairs so that the adult sits between the student and the door, making running away less likely. Minimize distractions in the room.

3. Teach

Steps in Teaching a New Skill or Activity

- Show the student the activity and the reinforcer.
- Begin with the first step of the task-analyzed sequence.
- Use words, gestures, or physical cues (in whatever combination is appropriate for the student) to communicate "first do the task, and then get the reinforcer."
- Prompt as required.
- Reinforce the student.

Note:

- It might be necessary to start with a full hand-over-hand prompt to maximize the student's success and your opportunity to reinforce.
- Initially, reinforce every correct response, even if you have provided complete physical support. Always pair social reinforcement (such as verbal praise, high-five, head-rub, or whatever students have shown you they like) with the concrete reinforcement.

- Fade to a lesser physical prompt as appropriate, such as touching the elbow or lifting the hand, then using a gestural prompt and then a verbal prompt.
- Gradually provide the reinforcer less frequently so that the student is doing more or staying on task longer.
- Trial and error will show how to adjust the sequence for students who can't tolerate touch, or who can't process verbal prompting while trying to do a motor action.
- Before a student with ASD can do the activity independently, or as a shared social experience, he will have to be able to stick with it long enough to learn to do the actions of the task so that it becomes automatic. This allows him to remember and anticipate the sequence and enjoy the predictability.
- If the student resists, try to persevere over several sessions; resistance may be a reflexive reaction to anything new.
- When the student has mastered the activity with one adult, try to involve one other familiar adult and then a familiar peer. The student now has a new task that no longer involves doing the activity, but managing the physical presence of the other person, the parallel play, the sharing of materials, or the waiting and turn-taking. It might be necessary to go back to more frequent reinforcement and shorter sessions until the student learns to manage, and then to enjoy, the activity as part of a social experience.
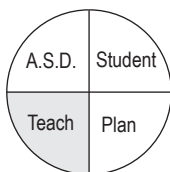
At this stage, the team is

❑ familiar with the learning characteristics of a student with ASD

❑ familiar with general instructional strategies

❑ able to identify areas of need in student learning

❑ able to prepare the student to participate in learning

❑ able to teach a new activity or skill