Recommended Best Practices for Inclusive Education: *Elementary & Middle School*

Research over the past 40 years has shown us the ways in which having Down syndrome may impact learning and development. When we understand these differences, we can design more effective interventions and educational strategies to support students with Down syndrome. The practices outlined in this resource are excerpted from ***Down Syndrome: Guidelines for Inclusive Education***, a document developed by the National Down Syndrome Society (NDSS) and Down Syndrome Education International, to **improve the development and educational outcomes for individuals with Down syndrome**. This resource addresses elementary and middle school years. Please refer to our other resources for information on other age groups.

Speech and Communication

Speech, language and communication will continue to be priorities for all children with Down syndrome. At 5-6 years of age, their individual progress will vary widely, with some children having 400-word vocabularies and talking in short sentences, while others have 50-100 words and talk in one-word utterances. Vocabulary development paces progress to sentences and grammar. Children need to have 50-100 different words before joining two words together and about 250-300 words before they begin to develop grammar in sentences. Teaching a wide range of vocabulary is an important target through these school years, as is teaching sentences and grammar. Most children will not be able to produce all speech sounds or say words clearly – this takes time and practice for all children, so speech work is also a priority.

These targets can be linked with reading and phonics teaching. Many speech and language goals can be embedded in the curriculum, but every child should have a speech, language and communication program designed and supervised by a speech language pathologist. Some children will benefit from continuing to sign and/or use a communication device.

Math

This is an area where many students with Down syndrome struggle, and research shows many graduate high school with minimal understanding of numbers or the ability to calculate. This may be because not enough time is spent ensuring children learn to understand quantity, counting, cardinality and equivalence with numbers 1-10 before moving on.(84) Too often children can count or recite numerals from a number line with no understanding of how the count words or numbers represent quantities.

Students will benefit from number teaching schemes that use visual materials, but only if they already have the basic understanding above and can understand how the materials represent quantities.

Students with Down syndrome should be included as much as possible with whole group instruction and work in small group sessions with students who share similar numeracy-based needs within the general education classroom. Functional math should be taught in order to supplement, not supplant, the general education math curriculum. Functional math must focus on 21st century skills (i.e. using a calculator) unless otherwise specified in a child's IEP. Functional math topics may include numeracy, time, money, number skills for shopping and cooking, weighing and measuring.

Reading

Daily instruction in reading is vital throughout elementary school. Students with Down syndrome may have delayed language skills compared to their typically developing peers, but research shows that they should be taught to read by 5-6 years of age using a comprehensive approach, which includes teaching sight words and phonics in the context of finely leveled book reading. Learning to read can enhance a student's articulation skills, and words that are learned in print first are then integrated into a student's vocabulary for expressive use.

Many students may have already begun to learn to read in early intervention and preschool programming services. It is essential that support to develop reading skills continues at the elementary level to continue progress in this academic domain. Initially, students will be taught familiar words, quickly building into phrases and then sentences.

Instruction should begin using a whole word approach and follow match-select-name methodology. Instruction in phonics should be provided alongside the whole word instructional approach and should focus on kinesthetic and visual techniques.

Learning letter-sound correspondences may improve a child's speech sound discrimination and production. High frequency words (e.g., the, a, is, who) that cannot be linked to concrete objects must be embedded into contextual phrases and sentences, not taught solely in isolation.

Reading comprehension activities are essential at all developmental stages of reading skill acquisition. Content of texts must take account the child's language comprehension level, or they will not be able to understand it.

Books that present information that is familiar to the student should be created (e.g., familiar experiences at home, in the school and in the community) and use simple, familiar language. There are a number of apps that make it simple to take photos and develop topic books as the student works on a specific curriculum topic.

When assessing a student's level of comprehension, alternate response methods may demonstrate a more accurate picture of the student's understanding (signing, pointing, choosing, drawing, etc.). The language in the individualized texts may also be reinforced by demonstrating the sign associated with the word. This strategy may improve word recognition.

For most children with Down syndrome, word-reading is a strength due to higher levels of information integration when presented in a visual manner. Some children with Down syndrome (10- 19%) will word-read at their expected chronological age/grade level because of the connection between written text format and the learning profile of a child with Down syndrome. Reading makes language visual and helps overcome the difficulties that children with Down syndrome may have with learning auditorily, due to poor verbal short-term memory.

It is not appropriate for students with Down syndrome to be grouped with students from a younger grade level for the purpose of literacy or numeracy instruction.

Reading, continued

Students should be included in literacy lessons with their typically developing peers. In addition, individualized instruction should also be provided during reading blocks for 10-20 minutes and may involve the student working with their special educator or paraprofessional under the direction of the special educator or service providers. This could take place within the classroom or in a quiet setting depending on the concentration and motivation of the individual child. Children should also be involved in small group learning with their typically developing peers who have similar literacy-based needs. Reading lessons may require some accommodations in complexity of text and language as well as length. Lessons should use a variety of texts, including the abovementioned individualized texts that include familiar circumstances, locations and events.

Comprehension skills are typically delayed compared to a student's skills in fluency and decoding, therefore must be considered and developed alongside word identification skills. Text selection must consider the complexity of the text in three different domains: reading level, appropriateness of language, and topic content. Questions that assess comprehension should be reinforced by visual supports (e.g., the question is written down, prompts to refer to text or illustrations, answers provided in multiple choice format).

Writing

Writing skills, the ability to record work on paper, may be delayed due to the physical demand of writing tasks, motor challenges, hand structure, language difficulties, vision issues, delayed response in note-taking and/or cognitive deficits experienced by students with Down syndrome.

Producing written work is a highly complex task. Difficulties in short-term memory, speech and language, fine motor skills and the organization and sequencing of information negatively impacts the acquisition and progress of writing skills for most children with Down syndrome. Schools may consider the use of assistive technology, such as word processing software accessible through typing and/or voice-to-text, which may allow students with Down syndrome improved access to the general education curriculum.

Alternate methods of recording responses may be required for individuals with Down syndrome. These methods may include assembling picture lists and displays; building sentences with word cards; scribing; using whiteboards, markers or preferred writing tools; cutting and pasting; underlining and highlighting; introducing cloze procedures; using interactive technology (e.g., Co:Writer, smartboards), integrating augmentative communication devices, encouraging typing vs. writing, etc.

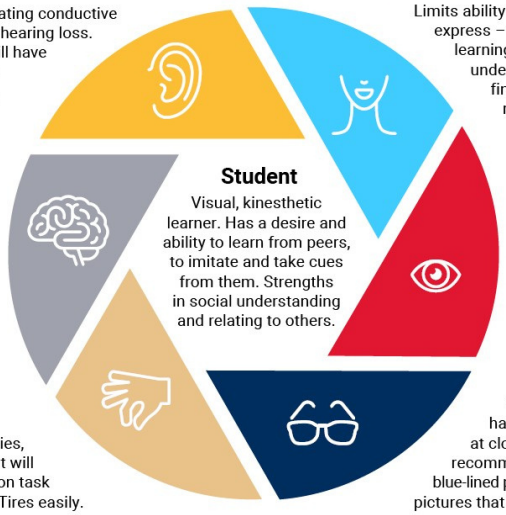
Activities to improve handwriting abilities should be informed by an occupational therapist, and limited handwriting ability should not prevent students from recording their thoughts or work. Most students improve their handwriting during elementary school years.

Transition Planning

Transition supports for moving on to middle school or high school should be considered the year prior to the child's final year in the prior setting. The anticipated school staff and the student should be involved in the elementary or middle school annual review that outlines transitional supports during the student's final school year. The final annual review should be held during the fall semester to enable the transition plan to be put into place over the remainder of the academic year.

Student input gathered at the annual review should be considered in schedule creation, elective selection and goal-setting. Transitional supports should include staff making reciprocal visits, progression toward several full day visits for the student at the new school and student attendance at welcome events and orientation at the middle school or high school that they will join.

A Unique Learning Profile: Students with Down Syndrome



Hearing impairment

Some 80% of preschool children experience fluctuating conductive hearing loss with some 15% having sensori-neural hearing loss. For many, hearing loss persists in school years. Will have difficulty listening to whole class input, listening in noisy environments, processing spoken language, discriminating speech sounds, learning phonics.

Speech & language delay

Limits ability to communicate. Understand more than can express – knowledge may be underestimated. Will influence learning from listening, processing long sentences, understanding new or subject specific vocabulary, word finding, forming sentences, understanding instructions, reading comprehension skills, thinking and reasoning.

Verbal memory weakness

Difficulty learning from listening - maintaining attention, retaining instructions, memorizing sequences, learning new vocabulary and information. Challenges in retaining and consolidating learning into long term memory.

Visual learning strengths

Ability to learn and use sign and gesture, to learn to read and use written word. Strengths in learning through imitation, from modeling and demonstration. Learns well from visual resources (pictures, photos, diagrams, symbols, concrete materials, digital technologies and apps).

Delayed motor skills

Linked to low muscle tone, loose ligaments and developing motor plans. Affects all physical activities, delays self-help skills and handwriting progress but will improve with practice. May have difficulty staying on task & multi-tasking. Easily distracted by other factors. Tires easily.

Visual impairment

Occurs for all students, to some degree. All children have poor visual acuity (soft focus) and 80% poor focus at close range (up to 10 inches). Bifocals are routinely recommended. Difficulties with: writing using a pencil on blue-lined paper, reading< 18 point font, coping with text/diagrams/ pictures that are too cluttered, detailed, or have little contrast.

The complete version of *Down Syndrome: Guidelines for Inclusive Education* can be found online:
https://ndss.org/inclusive-education-guidelines

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