New Hampshire
Department of Education
Serving New Hampshire's Education Community

A Resource Guide for Dyslexia and Other Related Disorders

PREFACE

The New Hampshire Department of Education recognizes the importance of learning to read and write for all students. Through the passing of House Bill 1644 and New Hampshire Revised Statutes Annotated (RSA) 200:62, the New Hampshire Department of Education, in conjunction stakeholders, has developed this resource guide for dyslexia and other related disorders. This handbook includes information about neurological research facts, academic interventions, evidenced-based strategies, classroom accommodations, and technology tools to assist teachers and specialists with providing supplemental assistance and instruction for children who exhibit characteristics of dyslexia or dysgraphia. The intention of this guide is to serve as a resource for administrators, teachers, specialists, and families to access information and gain knowledge to support learning experiences for children in literacy.

RSA 200:62
Section 20062 Dyslexia Resource Guide .htm

ACKNOWLEDGEMENTS

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The Neural Basis of Dyslexia

Researchers across the country have been able to study the neural systems of the reading brain by using functional magnetic resonance imaging (fMRI). Studies have compared the brain activity while reading of typically developing readers with those of individuals with a reading disability. Results have consistently shown that there are disruptions in the activity in the left hemisphere of the brain. Reading is mapped onto the language areas of the brain. Our brain puts those systems to work for reading, and our brains adapt to reading tasks. The primary areas of the brain used for reading are the occipito-temporal system, the parieto-temporal system, and the inferior frontal gyrus.

Inferior frontal gyrus
(articulation and word analysis)

Parieto-temporal
(word analysis)

Occipito-temporal
(word form)
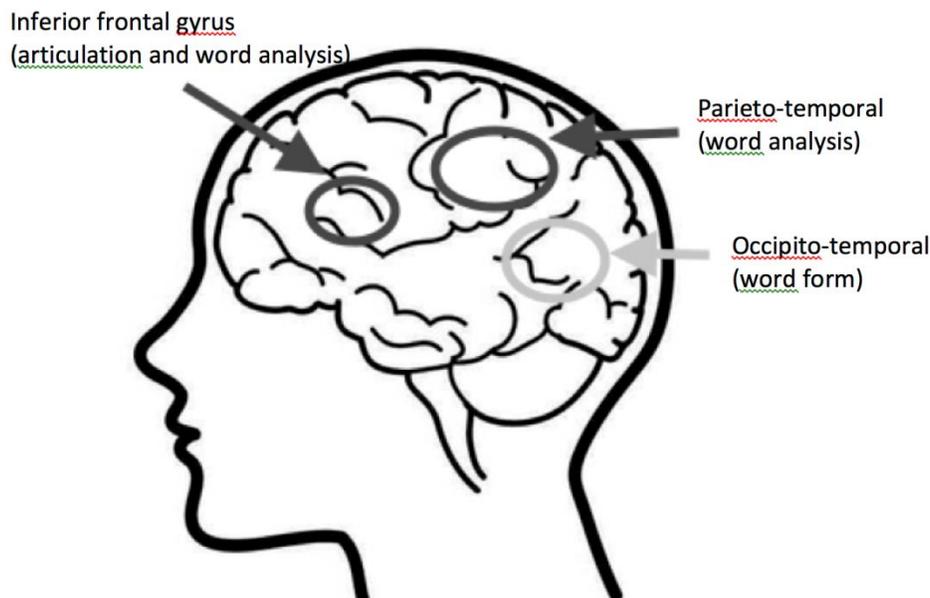
While reading, the brains of impaired readers are not as activated in the parieto-temporal area of the brain, which is the area where phonemic processing occurs. There is increased activity in the inferior frontal gyrus in the front of the brain, which is not an efficient area for decoding, and not an area used by typically developing readers for decoding.

Our brain systems rely on efficient connectivity between the different areas of the brain in order to read fluently. Connectivity analysis has revealed that the brains of individuals with dyslexia do not form the varied and extensive connections between the brain's reading systems we see in the brains of typically developing readers.

Connecting Research to Practice

Numerous studies around the country and around the world have shown that explicit instruction in the alphabetic principle for reading and spelling, including phonemic awareness and phonics, results in gains in reading skills. A comparison of fMRIs before and after such interventions shows increased activation in the reading systems of the brain.

With instructional treatment, early elementary children through grade three with reading impairments were more likely to increase brain activity in the same areas of the left hemisphere as typically developing readers (Aylward et al., 2003; Berninger, 2013; Pugh et al., 2013; Richards et al., 2013; Shaywitz et al., 2006).

All ages of individuals with reading impairments showed a difference in brain activation after reading intervention. Upper elementary and middle school children showed some increases in activity similar to typically developing readers and also showed some compensation in the right hemisphere (Pugh et al., 2013; Richards et al., 2013). Adult individuals with dyslexia, after instructional treatment, showed increased activity in compensatory areas in the right hemisphere.

Dr. Sally Shaywitz and Dr. Bennett Shaywitz of Yale University have been pioneers in research regarding struggling readers. Shaywitz et al. (2004) conducted a study that compared pre and post brain imaging results of students who had a reading disability. The experimental group of students received an explicit, systematic phonological intervention for 50 min. per day for eight months. The intervention had a lasting influence on the reading systems of the brain. In particular, the occipito-temporal region, which is responsible for fluent reading, had continued to develop a year after the intervention ended.

Research done by Gebauer, D. et al. (2013) at the Medical University of Graz in Austria found increased activation in the reading centers of the brain in the left hemisphere following five weeks of intervention using a morpheme-based strategy.

Current research has begun to examine the connectivity between the reading systems of the brain. Strong connections help individuals read more fluently and efficiently. Koyama et al. (2013) examined changes in connectivity among the reading systems in the brain after reading intervention. MRI data was gathered at the New York University Center for Brain Imaging. The researchers found increased connectivity between the parietal and frontal regions of the brain in students with dyslexia who received intervention.

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What is dyslexia?

I. "Dyslexia'' means a specific learning disability that is:
(a) Neurobiological in origin;

(b) Characterized by difficulties with accurate or fluent word recognition and by poor spelling and decoding abilities that typically result from a deficit in the phonological component of language; and

(c) Often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction, and may include secondary consequences such as reading comprehension problems and reduced reading experience that can impede growth of vocabulary and background knowledge.

NH RSA 200:58

Breaking the definition down, it means:

(a) Neurobiological in origin:
There is a brain basis for dyslexia. fMRIs have provided evidence that the areas of the brain used for reading are not as activated in individuals whose reading is not progressing as expected. Dyslexia often has a strong hereditary link, so scientists have been able to study fMRIs of individuals at-risk for dyslexia prior to the onset of reading instruction. A similar pattern of brain functioning can be observed even prior to reading instruction beginning. Effective intervention can develop the systems in the brain used for reading so that they function in a way similar to those of typically developing readers.

(b) Characterized by difficulties with accurate or fluent word recognition and by poor spelling and decoding abilities that typically result from a deficit in the phonological component of language:
Phonological processing contributes to an individual's ability to segment the sounds of our language while spelling, as well as blending the sounds associated with letters while reading. Fluent word recognition develops from repeated accurate practice with reading. Development of fluent reading skills is hampered by difficulties with phonological processing.

(c) Often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction, and may include secondary consequences such as reading comprehension problems and reduced reading experience that can impede growth of vocabulary and background knowledge:

Children who have average to above average cognitive abilities may still have difficulty acquiring reading skills. Their intellectual profile may not have any areas in the below average range. In addition, despite evidence-based classroom instruction, they may still struggle to learn to read at an expected rate. The resulting lack of experience reading directly impacts their word knowledge, background knowledge, and reading comprehension.

Related Disorders

Several disorders may co-occur with dyslexia. NH's RSA 200:58-62 calls for attention to dyslexia and related disorders such as dysgraphia, dysphasia, phonological processing disorder, and reading fluency disorder. In order to fully support our struggling students, it is important to understand these learning disorders. In this next section, we will concentrate on dysgraphia. There is far less research available about dysgraphia as compared to dyslexia, and more work is needed to develop our understanding of dysgraphia, how to screen for it, and what interventions to provide.

What is dysgraphia?

Dysgraphia is a learning disorder that may be related to dyslexia.
Dysgraphia means: **dys** (impaired) + **graphia** (handwriting)
Dysgraphia is a specific learning disorder with impairment in written expression resulting from:
- Fine motor difficulties
- Visual Spatial difficulties
- Handwriting trouble

Students with Dysgraphia have ''writing skills (that) are substantially below those expected given the person's chronological age, measured intelligence, and age-appropriate education.'' (Black, 2014)

Breaking the definition down, it means:

Children with dysgraphia may have difficulty with both orthographic coding (spelling) and planning sequential finger movements, but do not have a primary developmental motor disorder. Research to date has shown orthographic coding (the ability to store

unfamiliar written words in working memory and create permanent memory of written words) in working memory is related to handwriting.

Dysgraphia is thought to be the result of impairment in the cerebellar region or due to impairment in the cortico-cerebellar loop. The cerebral cortex is the gray matter covering the brain's hemispheres. The cerebellum helps "program" handwriting to automaticity as it receives information processed through the cortex. Handwriting involves sequential movements coordinated through the visual and motor systems and involves coordination among all four lobes of the brain. Unlike dyslexia, dysgraphia has not been found to have a familial link.

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CHARACTERISTICS OF A CHILD WITH DYSLEXIA OR DYSGRAPHIA

Not all students at-risk for dyslexia and dysgraphia have the same profile inclusive of all characteristics. Some students may exhibit more than others. Difficulty in areas that are developmentally appropriate would not necessarily be an indicator of dyslexia or dysgraphia. These characteristics would appear beyond a normal period of skill acquisition.

Characteristics of dyslexia tend to appear at certain grade levels. Writing is comprised of a cluster of skills. Characteristics of dysgraphia tend to appear when there are skill deficiencies in one or more of the groups. Students at-risk for dyslexia and dysgraphia may exhibit some or all of the characteristics. There are many traits to dyslexia and dysgraphia; therefore, profiles for at-risk students are unique to each individual.

Dyslexia

Kindergarten and First Grade:
- Difficulty in rhyming
- Difficulty breaking words into smaller parts (syllables) (e.g., "baseball can be separated into "base" "ball" or "number" can be separated into "num" "ber")
- Difficulty identifying and manipulating sounds in syllables (e.g., "pen" sounded out as /p/ /ĕ/ /n/)
- Difficulty rearranging letters to create another word (e.g., "lap" to "pal" or "was" to "saw")
- Difficulty remembering the names of letters and recalling their corresponding sounds
- Difficulty decoding single words
- Difficulty reading single words in isolation
- Spelling words the way they sound (phonetically) or difficulty remembering sequences in sight words seen often in print (e.g., "sed" for "said")
- Confusion with spatial orientation (e.g., up/down, over/under, right/left)

Second and Third Grade:
- Difficulty recognizing common sight words (e.g., "to," "said," "been")
- Difficulty decoding one syllable words
- Difficulty recalling the correct sounds for letters and letter patterns in reading

- Confusion with visually similar letters/numerals (e.g., b/d/p; w/m; h/n; f/t; 6/9)
- Difficulty connecting speech sounds with appropriate letter or letter combinations and omitting letters in words for spelling (e.g., "after" spelled "eftr")
- Difficulty reading fluently (e.g., slow, inaccurate, and/or without expression)
- Reliance on picture clues, story theme, or guessing at words
- Difficulty remembering spelling words over time and applying spelling rules
- Difficulty remembering sight words

Dysgraphia

Visual-Spatial Challenges:
- Trouble with shape discrimination and letter spacing
- Writes letters that go in all directions, and letters and words that run together on the page
- Hard time writing on a line and in the margins
- Copies text slowly

Fine Motor Challenges:
- Trouble holding a pencil correctly, tracing, cutting, tying shoes, doing puzzles
- Unable to use scissors well or color inside the lines
- Holds wrist, arm, or body in an awkward position while writing
- Gets a tired or cramped hand when writing
- Illegible handwriting

Language Processing Challenges:
- Trouble writing ideas on paper quickly
- Loses train of thought
- Difficulty following directions
- Difficulty understanding rules of games
- Erases often

Spelling Challenge:
- Difficulty remembering spelling rules
- Difficulty identifying misspelled words
- Lack of logical and sequential progression in spelling words
- Erratic structure and spelling errors
- Saying words out loud while writing

Grammar and Usage Challenges:

- Irregular and inappropriate use of punctuation and capitalization, or lack thereof
- Inconsistent use of proper verb tenses
- Doesn't write in complete sentences, but writes in a list format
- Writes run-on sentences

Poor Organization of Written Language:

- Poor grammar and sentence structure
- Disorganized expression, even at the sentence level
- One sentence constituting a paragraph
- Assumes others know the content
- Writes vague descriptions
- Is better at conveying ideas orally than in writing

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The Emotional Connection

Stress causes our bodies to release hormones that are meant to aid our survival mechanisms. Chronic stress, however, exposes our bodies to these hormones repeatedly, which can cause health problems. Stress and anxiety are often a daily part of the academic life of a student with dyslexia and can become chronic. For example, a child with reading difficulty, such as dyslexia, is directed by a teacher to read aloud in class. The child may be afraid that others will laugh at him or her. It is embarrassing for any of us to make mistakes in front of others, particularly peer groups, yet it is a situation these children with dyslexia face often. If our body's chemistry gets out of balance from a stressful situation, we can mentally shut down (Schultz, 2014). Those same hormones that help us deal with a stressful situation make it hard for us to concentrate on learning.

These feelings of anxiety, fear, and frustration can manifest themselves in observable behaviors. If teachers and parents understand the root cause of such behaviors, it changes the perspective of how adults in their lives view these behaviors. Some behaviors a child with dyslexia may exhibit in a classroom include:

- Hesitancy to enter a new situation, such as working with a new group of students, because of the fear of failure or fear of embarrassment;
- Resisting completing academic tasks, perhaps by "forgetting" to complete homework, avoiding doing classwork that involves reading or writing, or by using behavior to take the class off track;
- Exhibiting anger because of frustration due to frequent failure;
- Poor self-image resulting in feelings of inferiority, powerlessness, or stupidity;
- Hesitancy to volunteer to answer questions in class or participate in discussions;
- Developing a perspective that the world is a negative place which can lead to symptoms of depression that can manifest itself as apathy or lethargy.

Educators contribute to the feelings of success and achievement their students' experience. Recognizing that children learn to read at varied paces creates an individualized approach. Early intervention can prevent the onset of negative emotions in response to academic situations. By helping a child with dyslexia or at-risk for dyslexia achieve academic success early, a host of related problems can be avoided.

These individuals can learn skills and strategies that best support them in rigorous academic activities. It is healthier emotionally for the individual and prepares him or her to become a positive contributor to society.

Educators can provide a safe learning environment while maintaining high expectations for learning (Dweck, 2006). If educators become knowledgeable about dyslexia and other related disorders, they can help their students understand why reading and writing tasks are difficult while also acknowledging strengths in intelligence and other academic areas. Responses to a student's struggles can impact their willingness to persist and take risks. When a student makes a mistake, an artful teacher can consider the thought process that led to the error and create a teachable moment without diminishing the student's self-image. Sometimes a child's mistake can be amusing or frustrating to us as educators. It is important to make sure our body language and tone of voice are calm, non-reactive, and supportive when handling errors, whether we are working individually or with an entire class.

Teachers and parents can help create an environment in which a child with dyslexia can feel more successful in some very practical ways. Some of these include:
- Helping the child with dyslexia find the areas in which he or she can be successful;
- Encouraging the child by assuring him or her that teachers and parents will provide the support needed for him or her to be successful;
- Complimenting the child for putting forth good effort, even when the product is not what he or she had hoped;
  - For example, say, "I noticed you really thought that project through," rather than critiquing the spelling or handwriting.
- Finding ways to relate the child's strengths with academic activities;
  - For example, if he or she is a good artist, incorporate art into academic learning, or when learning landforms, have the child draw them and provide labels.
- Finding ways in which the child can help others in areas of strength.
  - For example, if he or she is strong in math, have them be a peer tutor or help a younger student.

The Social Connection

Social interactions are complex. Many children with dyslexia have a hard time sequencing and have difficulties with auditory memory or processing. Complex interactions with a larger social group involve a series of conversational points that may

be hard for children with dyslexia to process, remember, and respond to. It is important to note that every child with characteristics of dyslexia has different patterns of strengths and weaknesses. The descriptions above are included to help educators determine what might be contributing to the difficulties a specific child is experiencing.

Teachers can help decrease the stress and anxiety that children with dyslexia experience. In the classroom environment, teachers can:
- Provide a series of smaller, achievable assignments;
- Listen to the student's feelings. Help them name the feeling or emotion he or she is experiencing;
- Let the student know that he or she will not be required to read out loud in class;
- Whenever possible, let the child know in advance that you will be calling on him or her and state what you will be asking; and
- Call on the student when asking questions the student can answer.

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Screening

Data from the baseline screening is one indicator of whether a child is at-risk for dyslexia. The cut score determined by the screening tool triggers the initiation of additional intervention. Progress monitoring for these students should occur at regular intervals in order to determine the effectiveness of an intervention. The frequency of progress monitoring needs to be such that it provides timely information without detracting from the educational process.

Responsibility of School Districts

NH RSA 200:59 requires school districts to screen all students upon enrollment in kindergarten or first grade by November 30 of each school year beginning in 2017.

Progress monitoring is to occur at appropriate times after that. The frequency of progress monitoring is to be determined by each school district. Typically, all students are administered screenings three times per year (fall, winter, and spring). Students who are at-risk for dyslexia or related disorders need to receive additional progress monitoring. The assumption is that students at-risk are receiving evidence-based interventions responsive to the child's needs. Results of progress monitoring are an indicator of the effectiveness of the intervention.

Parents of children identified as having risk factors for dyslexia or related disorders need to be notified and provided with the results and findings of initial and ongoing screenings. The steps are as follows:

1. Student identified as at-risk
2. Parent notified and provided with a summary of screening results
3. Individual written and intervention support plans developed with parent/legal guardian
4. Periodic screening results from progress monitoring provided to parent/legal guardian

Purpose of Screening

First determine the purpose of the screening tool. Four common reasons are:

1. To identify students with risk factors associated with dyslexia that needs additional intervention and assessment;

2. To monitor the effectiveness of the chosen intervention;
3. To determine whether a student should receive additional screening; and
4. To determine whether to adjust the duration or target of the intervention.

Choosing a Screening Tool

The school district has the discretion to choose their own valid and reliable screening tools. If a tool is valid, it measures traits that are pertinent to the purpose and are likely to predict reading difficulties. (Refer to characteristics and risk factors of dyslexia.) Reliable tools provide dependable results and are not greatly affected by different forms of the assessment or administration by different testers.

When we use tools to screen for risk factors of dyslexia, it is helpful to consider how each measure in the screening tool relates to each risk factor or component of reading. The first chart below includes descriptions of each risk factor. Four similar charts follow below, one for each screening tool analyzed here. Risk factors are listed in the left-hand column. Subtests related to the risk factors and indicators are in the right-hand column. Commonly used screeners are: DIBELS Next°, AIMSWeb°, STAR (Renaissance Star Reading°), and PALS° (The Phonological Awareness Literacy Screening).

Descriptions of Risk Factors	
Risk Factors and Indicators	**Description**
Phonological and Phonemic Awareness	The ability to attend to, discriminate, remember, and manipulate oral language units at the word, syllable, and phoneme (sound) level
Sound Symbol Recognition	Knowledge of how the sounds in the language correspond to the letters
Alphabet Knowledge	The ability to name, distinguish shapes, write, and identify the sounds of the alphabet
Decoding Skills	The ability to read unfamiliar words by using letter-sound knowledge, spelling patterns and chunking the word into

	smaller parts, such as syllables or morphemes
Rapid Naming Skills	The ability to quickly name aloud a series of familiar items or objects
Comprehension	The ability to understand the meaning of language

DIBELS Next	
Risk Factors and Indicators	**Subtests**
Phonological and Phonemic Awareness	Initial Sound Fluency (Optional Beg.-Mid K) First Sound Fluency (Beg.-Mid K) Phoneme Segmentation Fluency (Mid-End K)
Alphabet Knowledge	Letter Naming Fluency (K-1)
Decoding Skills	Nonsense Word Fluency (Mid K-Beg. 2) Oral Reading Fluency (Mid 1-6)
Rapid Naming Skills	Letter Naming Fluency (K-Beg. 1)
Comprehension	Retell Fluency (Mid 1-6) Daze (DIBELS Maze) (3-6)
University of Oregon Center on Teaching and Learning (2017). *Dynamic Indicators of Basic Literacy Skills.* Retrieved from https://dibels.uoregon.edu/assessment/dibels	

AIMSWeb PLUS

Risk Factors and Indicators	Subtests
Phonological and Phonemic Awareness	Phoneme Segmentation (Mid K-Mid 1)
Sound Symbol Recognition	Letter-Word Sound Fluency (Mid K-Beg. 1)
Alphabet Knowledge	Letter Naming (K)
Decoding Skills	Word Reading Fluency (End K-End 1) Oral Reading Fluency (1)
Rapid Naming Skills	Letter Naming (K), Letter-Word Sound Fluency (Mid K-Beg. 1), Word Reading Fluency (End K-End 1)
Comprehension	Auditory Vocabulary (Beg. K - End 1) Vocabulary (2-8) Passage Comprehension (2-8)

Source: http://www.aimswebplus.com/

STAR: A Computer Adaptive Assessment

Risk Factors and Indicators	Reported Results
Phonological and Phonemic Awareness	Rhyming; blending; segmenting; initial, final, and medial phonemes; adding/substituting phonemes

Sound Symbol Recognition	Sound/Symbol correspondence
Alphabet Knowledge	Letters, alphabetic sequence
Decoding Skills	Regular and irregular spellings
Rapid Naming Skills	X
Comprehension	Purpose of reading, reading with comprehension
http://www.renaissance.com/products/assessment/star-360-before-update/star-early-literacy-skills/	

PALS-K and PALS 1-3

Risk Factors and Indicators	Subtests
Phonological and Phonemic Awareness	PALS-K: Rhyme, beginning sound awareness PALS 1-3: Blending, sound to letter
Sound Symbol Recognition	PALS-K and PALS 1-3: Letter sounds, spelling
Alphabet Knowledge	PALS-K and PALS 1-3: Alphabet knowledge
Decoding Skills	PALS-K and PALS 1-3: Concept of word PALS 1-3: Word recognition in isolation, passage reading
Rapid Naming Skills	PALS 1-3 only: Fluency
Comprehension	PALS 1-3 only: Comprehension
https://pals.virginia.edu/tools-k.html; https://pals.virginia.edu/tools-1-3.html	

Gathering Historical Data

If a child exhibits at-risk characteristics associated with potential indicators for dyslexia, gathering familial information can be helpful. Through a parent or guardian interview information can be obtained about family history of reading or spelling difficulties, acquisition of normal language development, and the ability to follow directions systematically.

Data Gathering Based on Screening Results

The purpose of data gathering is to guide instruction. Gathering data helps identify whether the child is making inadequate progress in reading. Inadequate progress should lead to one or more of the following responses:
- Increase frequency of instruction;
- Increase duration of instruction;
- Reduce the size of the instructional group;
- Adjust the type of instruction based on student needs, e.g. greater emphasis on phonological processing, vocabulary development, language comprehension; and
- Referral for additional evaluation.

Additional Academic Data Gathering for a Child At-risk

After an appropriate time interval, a student may not be at grade level, but the student's rate of progress needs to be considered. The team should consider whether the trajectory of improvement is sufficient to reach reading developmental milestones. If not, the student's educational team needs to gather additional educational information, including:
- Screening and progress monitoring;
- Work samples;
- Report cards;
- Interventions provided;
- Teacher reports of skills achievement in reading, writing, and math; and
- Receptive and expressive language as compared to peers.

Other Possible Data Sources

Consultation with speech-language pathologist
- Mispronunciation of common words
- Unexpected difficulty using or understanding grammatical structures

Data to Rule-In or Rule-Out Other Causes
- Vision screening
- Hearing screening
- School attendance

If a parent whose child is found to have risk factors of dyslexia and/or related disorders, NH RSA 200:59-IV states,

A parent or legal guardian of any student who is identified as having characteristics that are associated with potential indicators or risk factors of dyslexia and related disorders has the right to submit the results of an independent evaluation from a licensed reading or intervention specialist highly trained in dyslexia and related disorders for consideration by the student's school district. A parent or legal guardian who submits an independent evaluation shall assume all fiscal responsibility for that independent evaluation.

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EVIDENCED-BASED STRATEGIES

Evidenced-based strategies are those "effective educational strategies supported strongly by evidence from well-conducted research studies." (ESEA, 2002)   S. Abbott, Ed., writer of *The Hidden Curriculum,* recognized that strategies are considered evidenced-based if they are grounded by objective data analysis established by sound scientific educational research or examined measures of teacher and student performance. (2014) Charted below is a list of strategies designed to improve reading and writing student outcomes.

Strategy	What is it…	What it does?
Cloze Procedures	This is a technique in which words are deleted from a passage and students insert words to construct meaning.	It gathers information about the ability to deal with content and structure of text.
Concept Maps	A web diagram is customized to the reading structure or writing task for information gathering and organizing.	It deepens comprehension of new concepts and organizes information into a format for writing specific to purpose.
Provide Information	The teacher serves as the provider of information through direct instruction to reach mastery through the "I do," "We do," and "You do" model.	This allows the teacher and student to focus actively through an interactive model that promotes effective use of instruction time.
Guided Practice	This is a method that allows multiple opportunities to practice with teacher guidance with specific, constructive feedback.	This allows a variety of means to learn and interact with new concepts and skills.

Independent Practice	After guided practice, students should practice the new skill independently to reach mastery. The teacher monitors closely on performance.	This gives students more opportunity to engage with newly learned information and for teacher affirmation that skill is mastered.
Inquiry Learning	This is a process of presenting a question, problem, or scenario.	This can enables students to use the process of thinking to find the answer using evidence.
K ↓ W ↓ L	This is an introductory strategy that provides s structure for recalling information, increasing student engagement in wanting to know, and later listing what has been learned.	This helps students process and keep track of their thinking and gathering the thoughts of other students.
Literature Circles	Student led groups utilize teacher-created, open-ended questions using varying degrees of taxonomy to engage all readers and support critical thinking and reflection as they read, discuss, and respond to what has been read.	This facilitates cooperative learning and helps students to use each other as resources and create opportunities for reluctant readers to participate and engage in literature.
Sequential Narratives	This is a student generated report of a series of events arranged in a logical order of sequence.	This helps students develop prediction skills by recalling and organizing events in a systematic way and form relationships in text.
Scaffolding	This is the gradual shifting of responsibility after students have learned a strategy or task that was modeled.	This provides an effective way for students to gradually and then thoroughly learn a new skill or concept.

Modeling	The teacher models problems and solving strategies through direct instruction to reach mastery through the "I do," "We do," and "You do" model.	High-level teacher support and direction enables the student to make meaningful cognitive connections.
Nurture Metacognition	The teacher encourages students to think about options, their choices, and the results they may get.	It gets students thinking about what strategies they could use before choosing one and seeing how effectiveness of their choice.
Directed Reading-Thinking Activity	The teacher directs learners to look at the text title and graphics, and then asks students to make predictions. After reading a selection, the teacher stops and revisits prediction.	It gets students thinking about the context of text, utilizes background information, and allows for focus on either comprehension, or decoding strategies.
Class-wide Peer Tutoring	At the beginning of a week/unit, a pre-test is given about skills students will learn. At the end of the week/unit, the class is divided into 2 groups and students are paired, and given a post-test. Students take turns asking questions or performing a skill. A point is assigned to a question answered correctly. If wrong, correction is given, and a second opportunity is provided. The total points are gathered for each group.	It gets students working together to question, correct, and provides reinforcement by earning points. This increases student engagement and additional practice.

Printable Short Story Books (Computer generated or purchased series)	Books that emphasize sight words, word families, and short/long vowels. Students are able to color, draw, write, create overlays of words with glue, or other materials making words 3-dimensional.	This provides a means to use multisensory techniques that focuses on visual learning, and can incorporate tactile learning. Use of the printable books increases student engagement.
Segmenting and Blending Sounds using Kinesthetic Manipulatives	Students can bounce or toss a ball for each letter sound to segment words. Use of a stretch band is a tool used to segment sounds pulling back on the band, and blend the sounds slowing releasing the band. Use of a toy race care with a word written on a race track whereby students push the car slowly to segment the word and quickly to blend the word. Finger tapping is when students use their thumb and tap fingers on same hand to segment sounds.	This provides a means to use multisensory techniques that focus on kinesthetic learning. Use of the manipulatives increases student engagement.
Reinforcing Sights Words using Tactile Manipulatives	Teachers create a laminated mat or use a white board with sight words or words with silent letters printed. Students form the letters using playdough and squish the letters together as they say the word. Word building kits using magnetic letters or scrabble pieces and containers/bins with compartments and students place a letter in each	This provides a means to use multisensory techniques that focus on tactile learning. Use of the manipulatives increases student engagement.

	compartment to form single syllable or multisyllabic words. Using an open plastic box, teachers have a word written on paper placed on the top and sandpaper, shaving cream, salt, etc., on the bottom so students can write the word.	
Read It, Build It, Write It	A mat is created with three boxes in vertical order. The top box is titled read it with a word written in the box, the middle box is titled build it where a student uses magnetic letters to create the word, the bottom box has writing lines for a student to write the word. These can be laminated for lasting use.	This combines several multi-sensory techniques for reading and writing. This activity increases student engagement.

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Introduction

The characteristics of evidence-based effective intervention described in this section will benefit all learners and is not limited simply to students who have been found to be at-risk for dyslexia. Effective core instruction for reading and spelling has been shown to benefit all students. Supplemental, or targeted, instruction is more effective when it is aligned to the classroom's scope and sequence.

"Program" is the term used to describe specific, often packaged, materials used to provide reading instruction. "Practice" is the term that refers to the way instruction is delivered, or to the instructional strategies used. The findings of studies designed to identify best programs have yielded inconclusive results, whereas examinations of best practices have led to highly consistent results when such studies have been rigorously designed and systematically analyzed and compared.

The needs of students found to be at-risk for dyslexia can be addressed using evidence-based practices within a framework of multi-tiered systems of support (MTSS).

Core Instruction within the Context of Multi-Tiered Systems of Support

As with other models of multi-tiered systems of support, educators ensure that students are provided sound reading instruction at the universal level using the guidance provided by the National Reading Panel (NRP 2000) and the National Early Literacy Panel (NELP 2008). Then, increasing support in the form of targeted intervention aligned with the core or universal reading program is provided to students found to be at-risk. Students who do not demonstrate the projected response to targeted intervention then receive intensive intervention.

As mentioned earlier, educators should apply the core strategies or practices identified at every level of reading instruction given multi-tiered systems of support model. The five core components of evidence-based reading instruction are the following:

1. Phonemic Awareness
2. Systematic Phonics
3. Fluency
4. Vocabulary
5. Text Comprehension

All levels of intervention need to incorporate these five elements of reading. Phonemic awareness is a crucial skill for all students learning to read, and there is a greater emphasis on this skill at the kindergarten and first-grade levels. Systematic phonics instruction is a key component in early literacy. Decoding, reading fluency, and comprehension are highly correlated through third grade. After third grade, other factors in addition to decoding start to be statistically significant contributors to comprehension, including vocabulary, background knowledge, and knowledge of text structure.

Evidence-Based Core Reading Instructional Strategies

Phonological Awareness
Phonological awareness is the umbrella term that refers to the ability to attend to, discriminate, remember, and manipulate oral language units at the word, syllable, and phoneme (sound) level. The graphic below illustrates this.
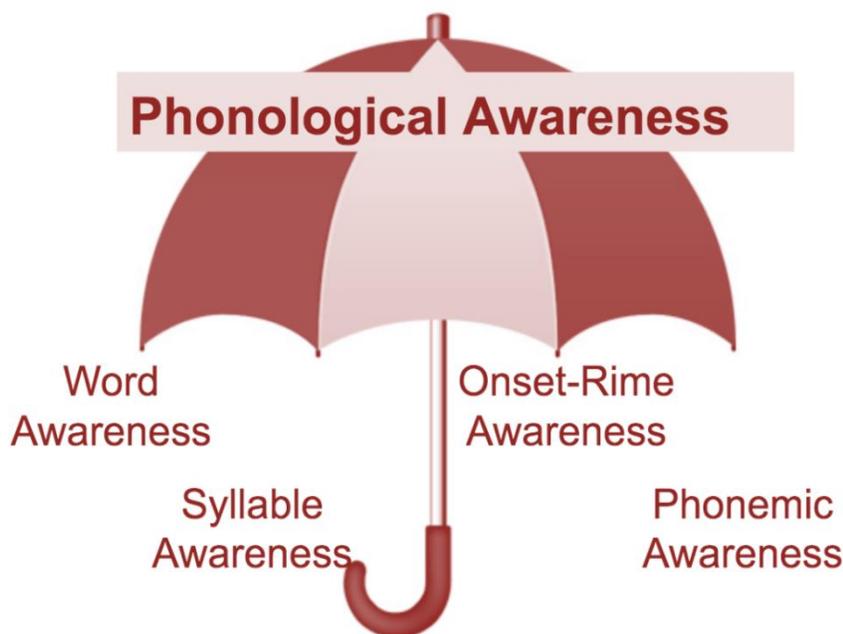
Phonemic Awareness

Phonemic Awareness is teaching how sounds (phonemes) are manipulated in language. Some sample phonemic awareness practices include the following:

Practice	Description	Example
Phoneme isolation	Recognizing individual sounds in words	Tell me the first sound in boy. (/b/)
Phoneme identity	Recognizing the common sound in different words	Tell me the sound that is the same in sit, sack, supper. (/s/)
Phoneme categorization	Recognizing the word with the odd sound in a sequence of three or four words	Which word does not belong? Tip, ten, pan (pan)
Phoneme blending	Requires listening to a sequence of separately spoken sounds and combining them to form a recognizable word	What word is /k/ /a/ /ch/ ?" (catch)
Phoneme segmentation	Requires breaking a word into its sounds by tapping out or counting the sounds, or by pronouncing and positioning a marker for each sound	How many phonemes are in thick? (3: /th/ /i/ /k/)
Phoneme deletion	Requires recognizing that a word remains when a specified phoneme is removed	What is stick without the /s/? (tick)

Systematic Phonics

Systematic Phonics Instruction

Planned Sequence	• Most commonly occurring sounds and concepts taught first
Paced	• Allows time for learning and mastery
Generalization	• Applies in a variety of contexts for reading and spelling
Review & Integration	• Previously taught skills are reviewed and integrated into new lesssons
Strengthen Connections	• Using reciprocal relationships to teach reading and spelling

Core reading instruction must include the evidenced-based practice of instruction in systematic phonics. The English language is primarily phonetic. Interestingly, 94-97% of words in the English language can be decoded using phonics or word analysis. Systematic phonics instruction is both synthetic and analytic. Synthetic phonics provides instruction in teaching letter sounds and teaching blending the sounds for reading whereas analytic phonics includes the analysis of letter-sound relationships in previously learned words and does not pronounce sounds in isolation.

Integration Phonemic Awareness and Systematic Phonics Instruction

Common phonics activities engage students in applying phonemic awareness and sound symbol correspondence to building and reading words. A skilled teacher can make instruction engaging when using systematic phonics. Children can become excited about learning more about the sound-symbol code. It is important to integrate phonemic awareness when teaching letter-sound correspondence. Students are asked to read, write and often demonstrate word meaning in typical phonics tasks.

Fluency: Accuracy + Rate + Prosody = Fluency

Core reading instruction will include the evidence-based strategy of fluency instruction. Fluent reading is, first and foremost, accurate. Accurate reading is necessary prior to become a faster reader. The practice of developing fluency includes the development of rate, or reading speed, and prosody, or expression while reading.

Fluency instruction focuses on assisting students in developing their ability to use typical speech patterns and appropriate intonation while reading orally.

Strategies to Increase Fluent Reading

Repeated Reading
* Readers Theater
* Choral Reading
* Echo Reading
* Fluency Cards

Oral Reading with Feedback
The student reads aloud to teacher, who gives feedback about skills and strategies.

Partner or Peer Reading
* Reading to peers
* Reading to young students
* Taking turns reading orally
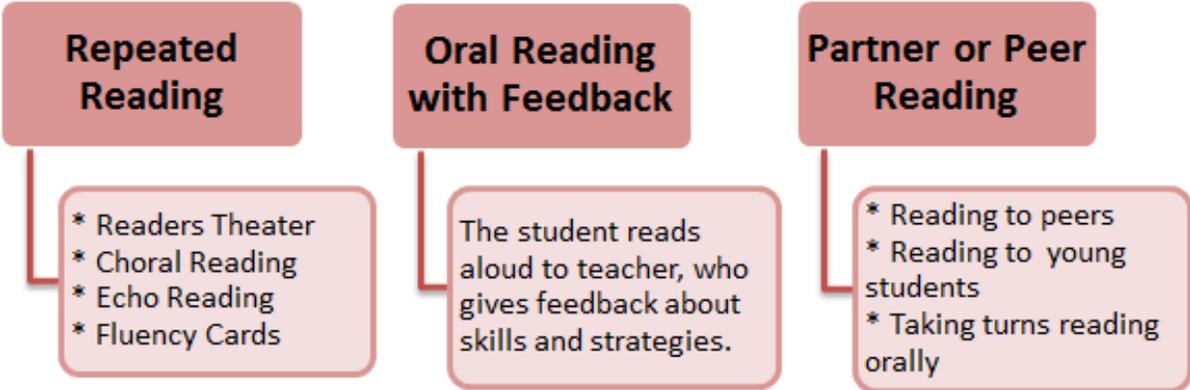
Vocabulary

Core reading instruction will include the evidence-based practice of vocabulary instruction. Vocabulary, or knowledge of word meanings, plays a key role in reading comprehension. Research supports both explicit, systematic teaching of word meanings and indirect methods of instruction. Repeated exposure to vocabulary is the most effective means of accomplishing learning. The National Reading Panel Report (2000) outlines a variety of vocabulary teaching practices or strategies. Students acquire vocabulary knowledge best when a variety of engaging methods is used.

Strategies for Effective Vocabulary Instruction

Explicit Instruction
Students are provided defintions or other characteristics of words to be learned.

Implicit Instruction
Students use text context to develop word meaning.

Multimedia Methods
Graphic organizers, objects, or experuences are used to teach vocabulary

Capacity Methods
Reading automaticy is accomplished through practice

Association Methods
Instruction has prior knowledge connect to new vocabulary

Comprehension

Core reading instruction is most effective when text comprehension is taught by actively involving students in multiple comprehension strategy instruction and strategy use in context over time. Multiple comprehension instructional strategies have been shown to improve students understanding of text. Cumulative instruction in comprehension strategies leads to students implementing these taught strategies. In order to develop habits in implementing reading comprehension strategies, students must use them actively. The strategies must be taught with ample opportunity for guided practice and then independent practice.

Evidenced-based Comprehension Practices

- Comprehension monitoring
- Cooperative learning
- Graphic/sematic organizers
- Teaching about text structure
- Question answering
- Summarization

Supplementary Instruction for Students At-risk

Supplemental instruction is provided **in addition to** the core instruction in the classroom. A student should not be removed from the core instruction in order to receive supplemental instruction.

The supplemental instruction provided for our students at-risk for dyslexia should be aligned with the scope and sequence being used in the classroom. Instructional materials used for supplemental instruction do not have to be from the same publisher. They can be adapted to coordinate with the scope and sequence of the classroom.

Students found to be at-risk for dyslexia need core reading instruction which includes phonemic awareness, systematic phonics, fluency, vocabulary, and text comprehension. Supplementary instruction, targeted intervention, needs to teach the structure of the English language within the framework of a multisensory structured language approach.

Multisensory Structured Language Approach

Why Use a Multisensory Structured Language Approach?

Multisensory Structured Language Instruction helps individuals at risk for dyslexia or diagnosed with dyslexia because it targets and develops the parts of the brain that are not functioning efficiently for reading.

What is Multisensory Structured Language?
The components of Multisensory Structured Language include:
- Instruction in the Structure of the English Language
- Simultaneously Multisensory
- Systematic and cumulative
- Explicit instruction
- Diagnostic-prescriptive teaching approach
- Synthetic instruction
- Analytic instruction

Multisensory Instruction

Structure of the English language	Systematic and Cumulative	Explicit	Diagonstic and Prescriptive	Synthetic and Analytic
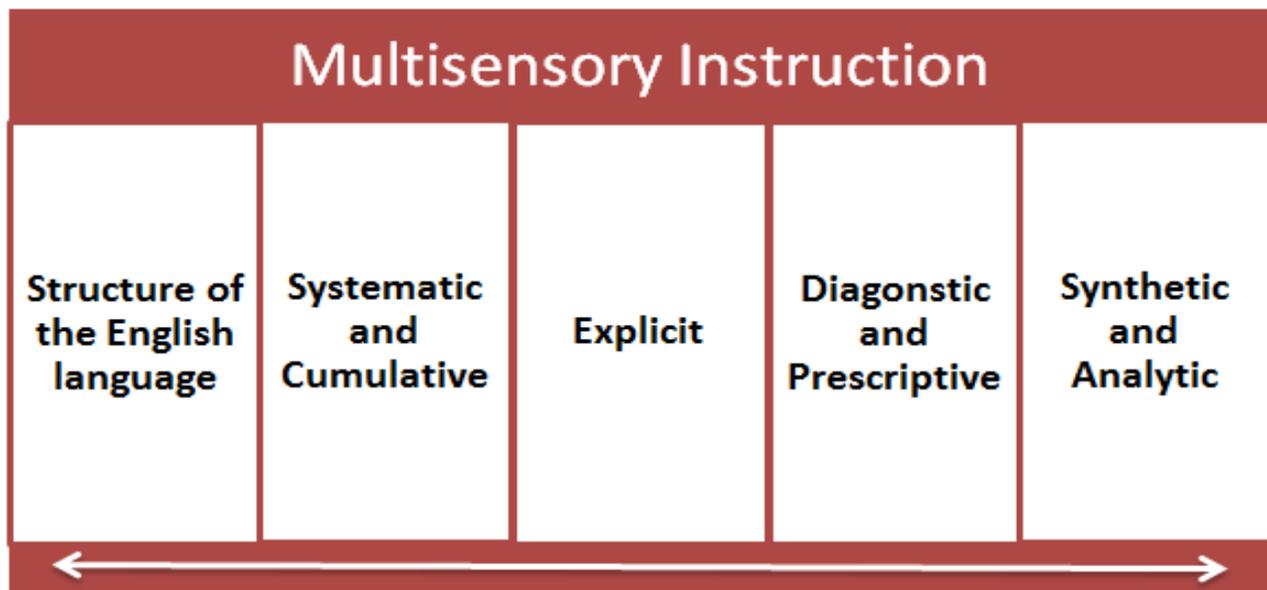
Structure of the English Language

When teaching the structure of the English language, we need to include the following components:

- Phonology
- Sound-Symbol Association
- Syllable Instruction
- Morphology
- Syntax
- Semantics

Simultaneous Multisensory

Multisensory structured language teaching uses all avenues of brain learning (visual/auditory, kinesthetic-tactile) simultaneously in order to strengthen memory and learning. For example, to learn the sound symbol correspondence "d"= /d/ when shown a flash card of the letter d, the student says the letter name "d", then the keyword "dog", then the sound /d/ while tracing the letter "d" on a bumpy surface. In this example, the visual component occurs when the student sees the letter, auditory component occurs when the student says the letter name and sound, the kinesthetic component occurs when a student moves their hand to make the letter shape, and the tactile component when the students feels the bumpy surface.

Systematic and Cumulative

Systematic means that the organization of material follows the logical order of the language. The most common and predictable skills and concepts are taught first so that students acquire skills with the highest utility first. Cumulative means each step is based on concepts previously learned. To enhance students' memory of the concepts they have been taught, previous instruction is reviewed systematically.

Explicit

The Multisensory Structured Language approach requires purposeful instruction of all concepts with continuous student-teacher interaction. Students are not left alone to deduce concepts. The teacher uses Socratic questioning to achieve an active interaction with the student. Multisensory structured language instruction requires the direct teaching of all concepts with continuous student-teacher interaction.

Diagnostic and Prescriptive

Diagnostic teaching is based on methodical, continuous assessment. When students make an error, the teacher mentally analyzes the cause of the error and designs instruction to help increase the students' skill and improve their accuracy. In this way, the teacher ensures students master presented content to automaticity, which is critical to freeing students' attention and cognitive resources for comprehension and expression.

Synthetic and Analytic

Multisensory Structured Language practices include both synthetic and analytic instruction. Synthetic instruction presents language in its pieces and then teaches how the pieces form a whole. Analytic instruction presents the whole and teaches how this can be broken down into pieces.

Reading and spelling have a reciprocal relationship. The use of both synthetic and analytic instruction strengthens neural connections in the brain. Practice in reading and spelling with the same skill build a stronger and faster neural connection to help students read and spell more fluently.

Choosing an Evidence-Based Intervention

Each school district has the discretion to choose evidence-based interventions. "Evidence-based reading instruction means that a particular program or collection of instructional practices has a record of success. That is, there is reliable, trustworthy, and valid evidence to suggest that when the program is used with a particular group of children, the children can be expected to make adequate gains in reading achievement. Other terms that are sometimes used to convey the same idea are research-based instruction and scientifically based research." (IRA 2002)

When teams are analyzing the current interventions being used or considering whether to use a different intervention, there are some questions they can ask themselves as shown in the table below. If the answer to any of the questions is "no," then the team needs to consider a solution to the problem.

Examining an Intervention for MTSS	Yes	No
Is it evidence-based?		
Does it use systematic phonics?		
Is phonemic awareness a component for K-1?		
Is teacher training available in NH?		
Is there a practicum component?		
Is there a certification?		
Are materials available?		

Sample Evidence-based Interventions

Below you will find an analysis of five commonly used evidence-based interventions that can be used at the targeted level of intervention. Charted below are several reading and writing interventions. These are commonly used; however, this is not an exhaustive list. Districts can choose an evidenced-based intervention that fits best for their personnel and students.

Orton-Gillingham (Approach)	Yes	No
Is it evidence-based?	X	
Does it use systematic phonics?	X	
Is phonemic awareness a component for K-1?	X	
Is teacher training available?	X	
Is there a practicum component?	X	
Is there a certification?	X	
Are materials available?	X	

Wilson Reading System	Yes	No
Is it evidence-based?	X	
Does it use systematic phonics?	X	
Is phonemic awareness a component for K-1?	X	
Is teacher training available in NH?	X	
Is there a practicum component?	X	
Is there a certification?	X	
Are materials available?	X	

LETRS	Yes	No
Is it evidence-based?	X	
Does it use systematic phonics?	X	
Is phonemic awareness a component for K-1?	X	
Is teacher training available in NH?	X	
Is there a practicum component?		X
Is there a certification? (Yes for trainers)	X	
Are materials available? (Teachers integrate activities.)		X

Lindamood-Bell (LiPS, Seeing Stars)	Yes	No
Is it evidence-based?	X	
Does it use systematic phonics?	X	
Is phonemic awareness a component for K-1?	X	
Is teacher training available? (Available in MA)	X	
Is there a practicum component? (At Centers)	X	
Is there a certification?		X
Are materials available?	X	

Project Read (Phonics, Linguistics)	Yes	No
Is it evidence-based?	X	
Does it use systematic phonics?	X	
Is phonemic awareness a component for K-1?	X	
Is teacher training available in NH? (By webinar or DVD)	X	
Is there a practicum component?		X
Is there a certification?		X
Are materials available?	X	

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CLASSROOM ACCOMMODATIONS

Classroom educators have become skilled at reaching a wide range of students in the classroom so that all students can have access to the regular education curriculum. These accommodations can be for all students without limitations as appropriate.

Universities and professional organizations have provided professional development in the principles of Universal Design for Learning (UDL) for curriculum development that gives all individuals equal opportunities to learn. UDL provides a blueprint for creating instructional goals, methods, materials, and assessments that work for everyone--not a single, one-size-fits-all solution but rather flexible approaches that can be customized and adjusted for individual needs. The proactive UDL design can make it so that teachers can easily differentiate and personalize instruction. (CAST, 2017)

Presentation of Information

- **Clarify or simplify written directions.** Teachers can underline or highlight significant parts of the directions, or rewrite the directions in the format of an itemized list, write oral directions on a display board (chalkboard, whiteboard, Smartboard), or have students re-craft the directions so they make sense to them. This can prevent students from becoming overwhelmed.

- **Present a small amount of work.** Teachers can separate pages from a workbook, divide tasks into separate steps, or create a packet with less information on each page. This can prevent students from being inundated with too much information and helps them to progress monitor through the steps needed to accomplish the task.

- **Reduce visual stimuli.** If students have difficulty focusing on tasks presented in written format, teachers can use a blank piece of paper to cover the sections not pertinent to the present task. Teachers can use line markers or increase font sizes for reading, windows to display individual math problems, increase space between lines, or use simple graphic organizers specific to the purpose of the writing task.

- **Highlight essential information.** Given a regular textbook, teachers can highlight the important information, such as critical features, big ideas, and relationships so long as reading performance is not the purpose of the activity or an assessment. This can aid students in reading comprehension, increase fluency, and gain content knowledge. This prevents students from focusing on word by word phonological tasks, which may not be the purpose of the activity, and reduces anxiety since reading takes a lot of time and can be a barrier to decipher important content.

- **Provide additional practice.** Teachers can supplement instruction with a variety of activities particular to student strengths and interests, such as instructional games, peer activities, computer software programs, individualized instruction through routine teacher-student conferences, etc. This can assist students to reach mastery, add interest, and gain confidence.

- **Provide a student-friendly glossary in content areas.** Teachers can create lessons or assist students to create a written or computer generated booklet to use as a reference tool for vocabulary in alphabetical order with easy to read definitions that include images and relevant examples. A separate glossary or reference tool can be used for different classes or one color-coded version to separate content areas. This can help students read more complex texts.

- **Develop study guides.** Teachers can embed review through concise study guides in lessons for review to offer the opportunity for students to recognize core key information, as well as scaffold exact details of what they need to know, and what to do with that information. These can be customized to include pictorial representations. Teachers can look for ways to make the content relevant and authentic for students so as they study the information, they are making connections to the information. The purpose of the study guide is to prepare for assessments, and is not used to while taking the assessment. This can increase familiarity with content, build study skills, and help students prepare for tests, all of which decreases test anxiety.

- **Use assistive technology.** Teachers can provide assistive technology, such as tablets, electronic teachers, talking dictionaries/spell checkers/thesaurus, text to speech programs, audio books, etc. This can increase accessibility to learning through a variety of means.

- **Repeat words as necessary.** Teachers can repeat or write on a whiteboard (or similar tool) important words, directions, etc. to students with dysgraphia. This can provide visual and oral clarity, and allow or students to use those words.

- **Create targeted, categorical word walls**. Teachers can create a targeted wall of vocabulary or sight words so that students can reference them when speaking, and to reinforce reading skills and vocabulary.

Delivery of Instruction

- **Use explicit teaching procedures.** Teachers can adapt commercial materials to include uniform, sequential step-by-step instruction. Teachers can review previously taught information to introduce new concepts, model expectations, provide guided practice with corrective feedback, and include monitored practice. This can give students a structure to learning and allows teachers opportunities for formative assessments to personalize learning. This can help students reach mastery and build skills in math, reading, and writing.

- **Provide a copy of notes.** Teachers can provide notes for students who have difficulty reading, writing, and listening simultaneously during delivery of instruction. Teachers can also allow for note-sharing or use of a computer or assistive technology device to type. This lets students to focus more what is being taught rather than the task of copying notes.

- **Provide models and work samples that included the step-by-step process.** A model can be used to assist students to find a starting point and methods to include key information for writing.

- **Provide a structured format for note-taking.** Teachers can offer a blank outline, chart, or graphic organizer specific to the purpose of lesson objectives to aid students in writing key information in a concise format and see the relationships among concepts and related information. This can increase student engagement.

- **Supplement verbal instruction with visual information, tactile devices.** Teachers can display pictures on an overhead, Smartboard, etc. to combine verbal and written information with a visual representation or hands-on manipulative to help

students see connections to information. This multisensory teaching style increases learning output.

- **Use peer-mediated learning.** Teachers can pair students to read-aloud to each other, write collaborative stories, and solve and check math problems as practice activities. This can boost confidence in students and create an alternate mode to teach and reinforce skills.

- **Design hierarchical worksheets.** Teachers can design worksheets and other tasks with problems or tasks arranged in progression from easiest to hardest. Early success often encourages students to continue to work toward the more challenging content.

- **Provide a set of textbooks for home use.** Teachers can supply students with textbooks to keep at home. This can give students extra time for reading and assist parents in providing support.

Student Performance

- **Adapt response mode.** Teachers can allow for typed responses rather than hand-written, allow students to write and record answers on written tests instead of an answer sheet, provide additional space for written responses, reduce the number of questions on each page, allow for computer-adapted assessments, provide dictation so long as writing is not assessed, read directions, passages, and test questions so long as reading is not assessed, etc. This is not an exhaustive list.

- **Place students in need of additional support throughout a lesson in close proximity to the teacher or rotate around the room.** Teachers can monitor for accuracy, provide additional support, and gauge pace and means of instruction during lessons based on performance. This also can provide a means to deliver positive reinforcement.

- **Encourage use of assignment books.** Teachers can assist students in organizing homework, school-related activities, projected due dates for assignments, and record future test dates. Teachers can adapt assignment books to student strengths and weaknesses by providing monthly, weekly, or daily formats. Information can be customized to particular students. A color-coded method can

be used to separate homework, test dates, extracurricular activities, etc. To supplement use of assignment books, teachers can email parents assignments to be completed, which can be faded as needed. Students are more likely to complete assignments if they learn time-management skills.

- **Allow flexible work times.** Students who work at a slower pace can be given additional time to complete assignments. Teachers can build supplemental work times simultaneously with additional time to complete assignments to prevent shortened recess or unified-arts classes, or an additional extensive homework load.

- **Use assignment substitutions or adjustments.** Teachers can allow students to complete projects versus written reports, etc., so long as the purpose of the assessment is not altered. This can cater to individual strengths to express knowledge of information.

- **Reduce redundant tasks.** If a student has mastered a concept or skill and does not need additional practice, a teacher can reduce the number of items to complete and allow for more time on items that need more practice and/or are harder to complete. This can help decrease extra class time needed to finish assignments.

- **Allow time for edit to check spelling with assistance on written work.** Teachers can edit spelling errors prior to accepting written assignments. If this is not possible because of time-constraints and the nature of the task, do not count spelling errors as part of a grade. This hinders student performance. Students are likely to write only words they can spell, rather than more complex words they know.

- **Only ask students with reading difficulty to read aloud if they volunteer.** Teachers can allow for this accommodation so that students can focus on the content of what is read aloud, follow along with the class, and reduce anxiety.

- **Adapt spelling lists.** Teachers can reduce the number of spelling words, so long as each skill is taught and assessed. This allows students to focus on the phonological structure and knowledge of sight words without being overwhelmed by a long list that tends to be memorized for the test and then forgotten.

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SUPPLEMENTS USING TECHNOLOGY TOOLS

The technological age has brought forth assistive technology in forms of computer software programs, web-based software, online tools, and mobile device applications to assist students with dyslexia and dysgraphia. Assistive technology is tool comprised of a device, equipment, or system that helps a children work around reading and writing challenges to foster learning.   Assistive technology is considered an effective accommodation or supplement to instruction.

These educational reinforcing and assistive devices have proven to be successful. Their intention is to provide accommodations for challenges, increase self-confidence, and practice. The applications and devices cannot replace direct intervention and instruction, but rather augment a program and used for supplemental purposes.

Device Applications

Below is a list of current mobile device applications. It is important to know that this is not an exhaustive list and new ones are created often. Children will require instruction and guidance to use the devices and applications. Many are to be customized by a teacher or parent.

Applications	What is it…	Device
LetterReflex: Overcoming Letter Reversals & Backwards Writing in Early Childhood Development & Dyslexic Children	This is an interactive application that serves as practice for kindergarteners and first graders and, is an effective therapy tool for second and third graders to distinguish between left and right with letters. It has 2 games to practice swiping letters and numbers using varied approaches for children who benefit from seeing and touching.	iPhone iPod Touch iPad

Gappy Learns Reading: Teach Spelling and Reading with Letters & Sounds and Sight Words	This spelling application services as a tool for kindergarteners to learn spelling basics, and improve reading and word recognition skills. It utilizes a cloze technique by filling in missing letters in words using capital and lowercase. It builds foundational skills with matching letters to names and sounds. Students master words in groups of 10 to earn a part of a house they can use to build Gappy's home. There are over 200 preloaded words.	iPhone iPad
Phonics Genius	This application uses a flashcard style to help students learn words by organizing letter single letter sounds or a combination to increase phonemic awareness and learn sight words. There are over 6,000 words grouped into 225 categories, including single letter and letter combinations. It includes a pre-recorded audio playback to practice sounding-out words. Some prior reading experience is required.	iPhone iPod Touch iPad
Word Bingo	This application is a sight word and spelling game for students in kindergarten through third grade. Many of the words come from the Dolch List. Up to 5 players can play. For registered users, scorecards are provided to track improvements.	iPhone
Reading Raven	This is an educational application for preschool children designed to teach skills from pre-reading to reading short sentences, word recognition, and spelling concepts using voice over instructions	iPhone iPod Touch iPad

	and mini-games. It has a feature to customize ages, create user profiles, progress tracking, and a reward system.	
SpellingCity	This is a companion application for the website www.spellingcity.com. Customized words lists can be created. It has an audio component. Pre-loaded word lists by category and subject are included. Students can use 6 activities such as hangman, matching, unscramble, and tests. Students can create a profile that tracks progress.	iPhone iPod Touch iPad Android
Tech Finder	This study skills application allows students, either individually or with assistance, create custom flashcards. Students choose a flashcard template from specified categories. Pictures can be imported. It has prompts for information that should be included in the vocabulary word.	iPhone iPod Touch iPad
TextGrabber	This application allows a person to take a picture of text or scan the QR-code from any printed software. It has text-to-speech and translation to other languages capabilities. Font sizes are adjustable. All documents (extracted text) is saved in a history folder.	iPhone iPod Touch iPad
Read&Write	This application has an alternative keyboard that interacts with emails, social media, or forms online. The application has word prediction capabilities that will speak as the user types. It has an edit feature that will	iPad Android Chrome

	read aloud a word, sentence, or passage. It has a talking and picture dictionary.	
Easy Spelling Aid & Translator	This application allows students to speak a word into a microphone, and it will spell the word and read it aloud. It also has translation capabilities. It has features including "OpenDyslexic" font and cover overlays.	iPhone iPod Touch iPad Android
Voice Recognition	This is a voice recognition application that can be used to type essays, documents, and emails. It has a save feature to store work.	Chrome Android
BeeLine Reader	This application will alter each line of text to a different color gradient.	Chrome
SnapType	This application will allow students to take a picture of a worksheet or import it from their device, and use the keyboard to add text to the document. The document can be printed, emailed, or shared.	iPhone iPod Touch iPad

Software, Web-based Programs, Online Tools

Below is a list of tools that are software programs, web-based programs, and online tools. It is important to know that this is not an exhaustive list and new ones are developed often. Children will require instruction and guidance to use the tools. Many are to be customized by a teacher or parent.

Tool	What is it…	Device
Bookshare	This web-based software is the largest online library of accessible books in the world. All of the digital books can be read aloud with text-to-speech features. To access Bookshare, a child must have a documented print disability, such as dyslexia.	Computer
Natural Reader	This offers free text-to-speech. Text can be pasted or imported from a document. Children then press play to listen. Features include different voices and reading speed. It also offers a variety of free e-books.	Computer iPad iPod Touch iPhone
Optical Character Recognition (OCR)	This free online software extracts text from scanned PDF documents and images (JPG, BMT, TIFF, GIF), and converts it to an editable Word or Excel document.	Computer
Rewordify	This online software simplifies text to make it easier to understand. Students paste text or a web page address into the tool. Rewordify replaces the difficult words with simpler words or definitions. In the tool settings, students can pick their reading level. There is an option to choose how the simplified text is	Computer

	displayed. It also has a library of classic literature and historical documents with simplified words such as Shakespeare and the Declaration of Independence.	
Quizlet	This is a study tool that lets students create electronic flashcards. The flashcards can have images, audio recordings, and text-to-speech. It also offers activities and games to help with studying skills. The online software can be synced to a mobile application.	Computer iPad iPod Touch iPhone Other mobile devices
TalkTyper **Speechnotes**	These are online dictation tools. Students speak into a computer microphone and the tool types what is said. It records on a basic word processor and can be edited with a keyboard.	Computer using the Chrome web broswer
Grammarly	This is an online proofreader. It finds possible mistakes in spelling, grammar, and punctuation, and suggests corrections. It also provides an explanation of the correction so students can learn from their mistakes. Text is pasted into the tool or uploaded from a hard drive. The free version checks spelling, grammar, and punctuation. The premium version has a reasonable monthly fee. It makes vocabulary suggestions, checks for plagiarism, and can be used in Microsoft Office programs for Windows.	Computer

Scrible	This online tool allows students to take notes on internet articles as they do research. All of the work is saved on an online account. This also automatically creates citations for articles and puts them into a bibliography.	Computer
MindMeister	This online software is a digital graphic organizer. Students can organize ideas using visuals, diagrams, and pictures. It assists with taking notes, outlining main ideas in a book, and assist with getting started on an essay. The tool has several built-in templates and students can create their own.	Computer
ClaroRead	This software program offers text-to-speech for webpages and documents. Words are highlighted as read aloud. It also offers masking, or can hide parts of the screen while students read to reduce distraction. It comes with a talking and pronunciation dictionary, and thesaurus.	Computer
Inspiration	This software allows students to create visual outlines to assist comprehension and understanding. There are several reading templates based on purpose.	Computer
Read&Write (formerly Read&Write Gold)	This software allows students to listen to webpages and documents read aloud. Words are highlighted as read. It works with OCR (mentioned above) to scan and read image files. Students can highlight and collect text, and includes features to assist with writing.	Computer

WYNN (for Windows only)	This software allows students to listen to webpages and documents that are read aloud. Words are highlighted as read. It works with OCR (mentioned above) to scan and read image files. Students can highlight and organize reading selections into notes. Students can control how documents are viewed with customized spacing, fonts, and margins.	Computer
Clicker 7	This software program allows students to rehearse and record what they say before writing it. Also, when a sentence is typed, the program reads it aloud using kid voices. Words are also highlighted as read aloud. This program allows students to create mind map diagrams and graphic organizers. It has a word prediction feature so that students can choose words and phrases from pre-selected lists that are presented as word banks. A talking dictionary is included.	Computer
Note-taking Pens: InforScan 2, InfoScan TS, InforScan Elite	These pens can scan lines of text and store on the device. It can be transferred to a word processor for text-to-speech application, and can allow the document to be read aloud and edited.	Device Computer
Reading Pens: ReadingPen 2, ReadingPen TS	These pens can scan text, enlarge font, read text aloud, and display a syllabic breakdown of words. It includes games to improve vocabulary and a thesaurus.	

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COMMON MYTHS AND FACTS

Dyslexia

Myth #1: Writing letters and words backwards are the most prominent signs of dyslexia.
Fact: Writing letters and words backwards may occur in any child prior to 2nd grade or the age of eight or nine. Dyslexia does not cause children to see letters, numbers, and words backwards or inverted. However, some children with dyslexia may confuse letters, misread words, or have difficulty forming letters as a result of the lack of phonological skills.

Myth #2: If given enough time, children will outgrow dyslexia.
Fact: Dyslexia is neurological in origin and is a lifelong reading condition. There is no evidence that indicates dyslexia can be outgrown. There's no cure to make it go away. There are interventions that can assist in building connections within the brain to increase reading skill; however, gaps still exist.

Myth #3: Dyslexia is more prevalent in boys than in girls.
Fact: Research shows that girls and boys are equally affected by dyslexia. There are many possible reasons for over-identification of males by schools, including behavioral acting out and difficulty using compensatory strategies.

Myth #4: A child with dyslexia will never learn to read.
Fact: This is simply not true. The earlier children who struggle are identified and provided systematic, explicit, and intense instruction, the less severe their problems are likely to be. With success, children with dyslexia can learn to read; however, may have a slower pace and difficulties will remain.

Myth #5: Dyslexia cannot be diagnosed until 3rd grade.
Fact: Early intervention is critical to the success of a child with dyslexia. Assessments of phonemic awareness; letter knowledge, speed of naming; and sound-symbol association can be completed as early as kindergarten. Systematic, explicit, and intense instruction in these specific skill areas can help predict reading ability in the first and second grades.

Myth #6: If children with dyslexia would just try harder, they would succeed.
Fact: Dyslexia is the result of a neurological difference beyond the control of the child.

Motivation is not usually the primary problem associated with reading difficulties, but may become a secondary problem due to repeated stress and failure in academic areas relating to reading.

Myth #7: Dyslexia is caused by brain damage.
Fact: The exact causes of dyslexia are not completely clear. However, brain imaging studies show significant differences in the way the brain of a child with dyslexia develops and functions. The neurological differences associated with dyslexia are genetic rather than the result of brain injury, damage, or disease.

Myth #8: Smart children do not have dyslexia.
Fact: Dyslexia is not a sign of low intelligence. It occurs in varying backgrounds and intelligence levels. With systematic, explicit, and intense instruction, and support in reading, many children with dyslexia go on to higher education and are very successful in their careers.

Myth #9: If children with dyslexia read out loud for 20 minutes per day, it will improve their reading.
Fact: Reading out loud will not help a child sound-out unknown words. Instead, the child will continue to try to memorize the shape of a word, and use pictures and context clues to try and guess, which will not foster reading development.

Myth #10: Retaining children with dyslexia (holding them back a grade) will improve their academic struggles with reading.
Fact: According to several institutions (i.e., U.S. Department of Education, American Federation of Teachers, National Association of School Psychologists), there is little benefit to retention because, most frequently, it does not improve a child's academic struggles in reading. It is not recommended that a child repeat another year of the same instruction.

Myth #11: Children with dyslexia can read; they cannot spell.
Fact: Children with dyslexia that spend hours each night working on a spelling list, they may be able to pass the test, but they tend to have difficulties spelling the same words when they're writing sentences or compositions. Poor spelling is highly related to poor reading.

Dysgraphia

Myth #1: Messy handwriting is a sure sign of dysgraphia.
Fact: Although many children with dysgraphia have poor, hard-to-read handwriting, not all do. In fact, some can write neatly, even though it might a lot of time and effort. There are other signs of dysgraphia besides sloppy handwriting. They include slow, labored writing and inappropriately sized and spaced letters.

Myth #2: Smart children do not have dysgraphia.
Fact: Dysgraphia is not a sign of low intelligence. It occurs in varying backgrounds and intelligence levels. Children struggle with writing down on paper what they know.

Myth #3: Children with dysgraphia are just being lazy.
Fact: Dysgraphia can make the act of writing a slow and taxing process. Some children may avoid writing assignments in school because writing is frustrating for them.

Myth #4: Dysgraphia is the same thing as dyslexia.
Fact: Both dysgraphia and dyslexia can affect children's' ability to spell. The two, however, are distinct conditions. Dyslexia makes it more difficult for a child to learn to read. On its own, dysgraphia doesn't affect a child's ability to read.

Myth #5: If given enough time, children will outgrow dysgraphia.
Fact: Dysgraphia is neurological in origin and is a lifelong learning condition. There is no evidence that indicates dysgraphia can be outgrown. There's no cure to make it go away.

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