



# Michigan Dyslexia Handbook:

## A Guide to Accelerating Learner Outcomes in Literacy

Version 1.1  
February 2025  
[www.michigan.gov/mde](http://www.michigan.gov/mde)





## **MDE Dyslexia Team**

**Julie Brehmer, M.A.** — Assistant Professor  
of Teacher Education, Saginaw Valley State  
University

**Paula Daniels, Ed.D.** — Former Director, Office of  
Educational Supports

**Corinne E. Edwards, Ed.D.** — Director, Office of  
Educational Supports

**Shelly Proebstle, M.A.** — Literacy Manager,  
Office of Educational Supports, MDE

**Teri L. Rink, Ed.S.** — Director, Office of Special  
Education, MDE

**Nancy Rotarius, Ed.S.** — State Policy Coordinator,  
Office of Special Education

**Kimberly St. Martin, Ph.D.** — Director, Michigan's  
Multi-Tiered System of Supports Technical  
Assistance Center

**Sarah Sayko, Ed.D.** — Technical Assistance  
Specialist, Region 8 Comprehensive Center

## **Michigan State Board of Education**

Dr. Casandra E. Ulbrich — President

Dr. Pamela Pugh — Vice President

Ms. Tiffany D. Tilley — Secretary

Mr. Tom McMillin — Treasurer

Dr. Judith Pritchett — NASBE Delegate

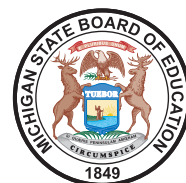
Ms. Ellen Cogen Lipton

Ms. Nikki Snyder

Governor Gretchen Whitmer — Ex Officio

Chairperson, State Superintendent

Michael F. Rice, Ph.D. — Ex Officio



# Michigan Dyslexia Handbook

---

## Acknowledgments

The Michigan Department of Education (MDE) would like to express its sincere gratitude to the educators and leaders who supported the writing of this document. These individuals shared their knowledge, expertise, recommendations, and perspectives about dyslexia. As a result, we believe the conceptualization and feedback strengthened the document and hope educators, school leaders, and district leaders find its contents helpful.

The following individuals served as content advisors:

**Scott K. Baker, Ph.D.** — Professor, University of Oregon

**Debbie Boersma, M.A.** — Literacy Consultant and Instructional Coach, Kalamazoo RESA

**Eunsoo Cho, Ph.D.** — Associate Professor, Michigan State University

**Heather Eckner, M.A.Ed.** — Director of Statewide Education & Outreach Autism Alliance of Michigan

**Claude Goldenberg, Ph.D.** — Professor Emeritus, Stanford University

**Loulia Kovelman, Ph.D.** — Associate Professor of Psychology, University of Michigan

**Nancy J. Nelson, Ph.D., NCSP** — Assistant Professor of Special Education, Wheelock College of Education & Human Development, Boston University

**Yaacov Petscher, Ph.D.** — Professor, Florida State University

**Selena Protacio, Ph.D.** — Professor of Literacy Studies and TESOL, Western Michigan University

**Lori Skibbe, Ph.D.** — Associate Professor, Department of Human Development and Family Studies, Michigan State University

**Katie Squires, Ph.D.** — Associate Professor, Central Michigan University

**Guy Suter, B.S.** — Public Policy, CEO - Ampli Inc.

**Adrea Truckenmiller, Ph.D.** — Associate Professor, Michigan State University

**David C. Winters, Ph.D.** — Professor, Head of the Department of Special Education, Eastern Michigan University

The following individuals critically reviewed the Dyslexia Handbook:

**Kelly Alvarez** — English Learner Educational Consultant, MDE

**Allison Burg** — Elementary Teacher, Novi Community School District

**Sue C. Carnell, Ph.D.** — Chief Deputy Superintendent, MDE

**Delsa D. Chapman, Ed.D.** — Deputy Superintendent, Division of Educator, School and Student Supports, MDE

**Harper DeMay, B.S. Ed.** — Academic Behavioral Strategist/Special Education Teacher, Gwinn Area Community Schools

**Rané Garcia, Ph.D.** — Director, Office of Diversity, Equity, and Inclusion

**Rachel Hannah, M.A.** — Special Education Teacher, Corunna Public Schools

**Kathleen Kish, M.A.** — Academic Interventionist, Holt Public Schools

**David Pelc, M.A.** — Reading Interventionist, The Reading League Michigan

**Gina Pepin, Ed.D.** — Elementary Reading Specialist, Escanaba Area Public Schools, Northern Michigan University and Grand Canyon University Contingent Assistant-Professor

**Jodi Pfeifer, M.Ed.** — Principal, Duncan Elementary, Utica Community Schools

**Pam Ryan, M.A.** — Masters of Reading, Schoolwide Title Coordinator, Elsa Meyer Elementary School

**Maria Sarata, B.A.** — Special Education Teacher, Holt Public Schools

**Maureen Staskowski, Ph.D. CCC-SLP, BCS-CL** — Speech, Language, and Literacy Consultant, Macomb Intermediate School District

**Bethany Tabacchi, M.Ed.** — Supervisor for Special Education Services, Macomb Intermediate School District

**Jennifer Taylor Boykins, B.A.** — MDE Contractor for the Office of Educational Supports

**Cheryl Valdahl, B.A.** — MTSS Interventionist, Wayne Westland Community Schools

**Kristy Walters, Ed.D.** — Special Education Coordinator, Corunna Public Schools

**Michelle Williams, M.A.** — Special Populations Manager, Office of Educational Supports, MDE

## Contents

---

Chapter 1: Purpose.....	1
Dyslexia Definition and State-Wide Efforts.....	1
Chapter 2: Introduction .....	2
Chapter 3: Understanding Dyslexia .....	3
Causes of Dyslexia.....	3
Dyslexia and the Potential to Co-Occur with Other Disorders.....	4
Dyslexia Myths .....	4
Chapter 4: Reading Science .....	7
Definition of Reading Science.....	7
The Reading Brain.....	8
The Reading Brain for a Beginning Reader versus an Experienced Reader.....	9
The Reading Brain and Dyslexia .....	9
Typical Reading Development Informed by Reading Science.....	10
Language and Literacy Development for English Learners with Dyslexia .....	13
Language, Reading, and Behavioral Characteristics That Could be Indicative of Dyslexia.....	15
Science of Reading and Instructional Implications.....	16
Chapter 5: Multi-Tiered System of Supports: A Framework to Meet the Individual Needs and Assets of the Whole Child .....	18
Intensifying Intervention Instruction to Accelerate Reading Outcomes.....	18
Instructional Principles to Support Students with Characteristics of Dyslexia.....	20
Effective Elementary Class-Wide (Tier 1) Reading Instruction.....	21
Changing Instructional Emphasis for Decoding and Word Recognition Skills .....	21
Effective Secondary Class-Wide (Tier 1) Instruction .....	22
Universal Screening: Identifying Learners with Characteristics of Dyslexia.....	24
Assessment System.....	28
Data Analysis for Continuous Improvement .....	29
Chapter 6: Professional Learning and Implementation Supports: What Districts Can Do.....	32
Chapter 7: Eligibility for Special Education Services.....	35
References.....	37

## Chapter 1: Purpose

The “Michigan Dyslexia Handbook: A Guide to Accelerating Learner Outcomes in Literacy” is designed to help educators and district and school leaders develop a shared understanding of best practices to prevent reading difficulties associated with the primary consequences of dyslexia (word-level reading disability) and to implement assessment practices needed to inform the provision of instruction and intervention methods for learners with dyslexia characteristics. The handbook begins to cohere state literacy efforts that support educators’ use of practices aligned with reading science, or based on scientifically informed theories, to accelerate reading outcomes for all learners (e.g., Essential Instructional Practices in Literacy documents). The handbook, therefore, defines terminology, explains critical concepts, and suggests additional resources for more information related to:

- Understanding Dyslexia
- Reading Science
- Supporting Literacy Acquisition within a Multi-Tiered System of Supports (MTSS) Framework
- Professional Learning and Implementation Supports for Educators and Leaders
- Special Education Eligibility and Services

The handbook aligns with Michigan’s Top 10 Strategic Education Plan, Goal 2: Improve early literacy achievement, and Goal 5: Increase the percentage of all students who graduate from high school, which aim to provide focused direction to Michigan’s education community in support of all learners. Additionally, the handbook builds upon the state’s MTSS implementation efforts to outline how the essential components of an MTSS framework, as defined by the MDE MTSS Practice Profile, can prevent literacy-related difficulties and provide a continuum of intervention supports for all learners, including those with characteristics of dyslexia (e.g., difficulty accurately decoding unknown words,

reading at a slower rate than grade-level peers, difficulty spelling words). For this reason, the MDE MTSS guidance, resources, professional learning, and supports from the MiMTSS Technical Assistance Center are referenced throughout this document.

### Action Steps and More Information

The end of each handbook chapter includes “Action Steps,” which suggest how educators and leaders may act upon the handbook information, and “More Information,” which provides links to websites and resources that have quality information about the handbook topics.

### Dyslexia Definition and State-Wide Efforts

Over the past few years, MDE has engaged in conversations with legislators, parents, dyslexia experts, researchers, and other stakeholders to discuss how to increase dyslexia understanding and outline the instructional practices and supports needed for learners with characteristics of dyslexia. Dyslexia is defined as:

*a specific learning disorder that is neurobiological in origin, characterized by difficulties with accurate or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities even though educators have provided effective classroom instruction. Additionally, this specific reading disorder may include secondary consequences, such as problems in reading comprehension and a reduced reading experience, that can impede the growth of vocabulary and background knowledge and lead to social, emotional, and behavioral difficulties. (Adapted from the International Dyslexia Association & National Institutes of Child Health and Human Development, 2002.)*



Dyslexia is a reading disorder primarily characterized by word-level reading difficulties originating from phonological processing weaknesses that cannot be identified in the absence of a student's response to effective phonologically oriented instruction. MDE is committed to working collaboratively with all stakeholders to improve literacy outcomes for every learner, including those exhibiting characteristics of dyslexia and identified with word-learning disability, who are the focus of this handbook. The Michigan Dyslexia Handbook does not address the other major subgroups of learning disabilities: specific reading comprehension disability (SRCD), written expression (WE), math-calculations (M-C), and math-problem solving (M-PS).

## Chapter 2: Introduction

Every child and adolescent is entitled to educational experiences that prepare them for lifelong learning, success in the workforce, and global citizenship. Although research is available to the educational community regarding the knowledge needed for learners to read and compose quality writing, not all educators can access this information and apply it in the classroom setting effectively. Not receiving quality literacy instruction aligned to reading science (as defined in the next section of this handbook) is detrimental to learners' abilities to achieve educational goals (Ehri, 2020; Hanford, 2020; National Institute of Child Health and Human Development, 2000). When centering equity, it is imperative that all learners, regardless of their identity (informed by their ethnicity, disability, gender, sexual orientation, family background, family income, and other factors), have access to the educational resources and instructional rigor needed at the appropriate time in their education to learn to read and write proficiently. MDE, therefore, is committed to ensuring Michigan educators obtain the information and resources needed to implement equitable literacy learning experiences for all learners.

MDE is responsible for compliance with state and federal education law, providing guidance associated there with, and supporting the implementation for educators and leaders. The implementation supports to prevent literacy-related difficulties and accelerate literacy outcomes for all learners, including children and adolescents with characteristics of dyslexia and specific reading or writing disabilities, are operationalized in a Multi-Tiered System of Supports (MTSS) framework. For children and adolescents who qualify to receive special education services for reading or writing disabilities, instruction in the general education setting is maximized and coordinated with special education services.

### ACTION STEPS

- Develop a plan for how to increase shared understanding of best practices for preventing reading difficulties that are associated with the primary consequences of dyslexia (word-level reading disability) amongst educators and district and school leaders.
- Identify a group of individuals who will read the Dyslexia Handbook and discuss strategies for incrementally orienting people to its contents for the purpose of designing a plan for developing educator expertise to prevent reading difficulties and to provide high-quality reading intervention supports that results in accelerating literacy outcomes for all students.

### MORE INFORMATION

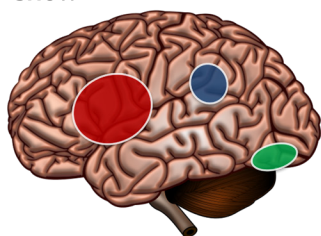
- [Michigan's Top 10 Strategic Education Plan, Goal 2: Improve early literacy achievement](#)
- [Early Literacy - Read by Grade Three Law](#)
- [Essential Instructional Practices in Literacy documents](#)
- [Michigan's Multi-Tiered System of Supports \(MiMTSS\)](#)

## Chapter 3: Understanding Dyslexia

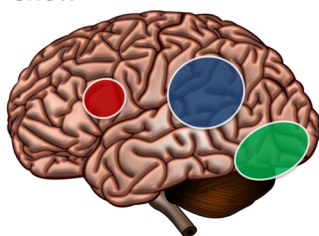
### Causes of Dyslexia

Dyslexia affects upwards of one in every five individuals, making it the most commonly diagnosed learning disorder (Shaywitz, 1998; Cortiella & Horowitz, 2014; Navas, Ferraz, & Amorina, 2014). Dyslexia is neurobiological, meaning it impacts specific regions of the brain that are important for reading development. These regions are typically located in the left hemisphere of the brain and are responsible for language, manipulating sounds, mapping spoken sounds to print, and instantly recognizing printed words. Dyslexia, therefore, is not a problem with visual processing, but rather with language processing of phonemes in the brain (Navas, Ferraz, & Amorina, 2014; Olulade, Napoliello, & Eden, 2013; Raschle et al., 2017).

**BRAIN PATTERNS THAT DYSLEXIC STUDENTS MAY SHOW**



**BRAIN PATTERNS THAT NON-DYSLEXIC STUDENTS MAY SHOW**



**Red: LEFT FRONTAL REGION.** Important for compensation  
**Blue: LEFT TEMPORO-PARIETAL REGION.** Important for phonological processing and grapheme-phoneme association  
**Green: LEFT OCCIPITO-TEMPORAL REGION.** Important for orthographic processing

*Figure 1. Differences in Brain Activation Patterns. Developed by and used with permission from Fumiko Hoeft, Ph.D.*

*Dyslexia is neurobiological, meaning it impacts specific regions of the brain that are important for reading development. These regions are located in the left hemisphere of the brain and are responsible for language, manipulating sounds, mapping spoken sounds to print, and instantly recognizing printed words.*

Functional magnetic resonance (fMRI) scans that measure and map the brain's activity have helped advance the understanding, research, identification, and treatment of dyslexia (Norton, Gaab, & Gabrieli, 2019; Ozernov-Palchik & Gaab, 2016). Figure 1 shows images of differences in brain activation patterns within the three regions of the left hemisphere for 1) a reader identified with dyslexia; and 2) a typically developing reader. While the impact of dyslexia can last throughout one's life, brain imaging research has shown that effective instruction can change the brains of learners with dyslexia to resemble those without dyslexia. Reading intervention research has further demonstrated that instructional practices can impact the brain regions responsible for learning to read (Gaab, Yu, & Ozernov-Palchik, 2018; Krafnick, Flowers, Napoliello, & Eden, 2011). Subsequent sections of this handbook provide more information about the regions of the brain responsible for learning to read (hereinafter "reading brain network") and effective intervention instruction.

Genetic factors influence dyslexia prevalence. Between 30% and 50% of children who have a parent identified as having dyslexia will develop the disorder (Mather & Wendling, 2012). Given the strong genetic influences in the etiology (i.e., cause or origin) of dyslexia, schools should include a questionnaire on family history of reading difficulties (or dyslexia) when evaluating a child's risk for dyslexia. Importantly, multiple sources of data indicating a learner's difficulty with reading acquisition, including genetic factors, can more accurately depict a learner's skills and needs. Therefore, the existence of genetic factors coupled with accurate assessment data may further explain the source of reading difficulties for individual learners. Subsequent sections of this handbook provide more information about how to collect and analyze data to identify learners with characteristics of dyslexia.

*Due to the strong genetic influences in the etiology (i.e., cause or origin) of dyslexia, schools should include a questionnaire on family history of reading difficulties (or dyslexia) when evaluating a child's risk for dyslexia.*

## **Dyslexia and the Potential to Co-Occur with Other Disorders**

Learners diagnosed with dyslexia may also be diagnosed with other disorders or conditions that co-occur with dyslexia (Pennington, 2006; Landerl & Moll, 2010; Moll, Snowling, & Hume, 2020). Importantly, these disorders can coexist and affect each other but do not necessarily cause one another (Pennington & Olson, 2007). The most common disorders that co-occur with dyslexia and contribute to difficulties in reading acquisition are Developmental Language Disorder (DLD) (Adolf & Hogan, 2018), Attention-Deficit/Hyperactivity Disorder (ADHD) (Mather & Wendling, 2012), anxiety and depression (Sanfilippo et al., 2019), and other learning disorders, such as mathematics disabilities (Landerl, Fussenegger, Moll, & Willburger, 2009; Joyner & Wagner, 2020).

Approximately 20% to 40% of individuals diagnosed with the inattention subtype of ADHD have reading difficulties (Wadsworth et al., 2015), and between 20% and 40% of learners identified with dyslexia may also have the inattention subtype of ADHD (Germano, Gagliano, & Curatolo, 2010). Further research is needed to better understand the overlap between dyslexia and ADHD, because the ability to treat one can impact both. When learners with ADHD avoid reading-related activities, their avoidance could be misattributed to their ADHD characteristics rather than correctly identified as significant and persistent reading difficulties due to dyslexia (Hoeft, 2017). Therefore, evidence-based instruction and supports for learners with co-occurring conditions should be integrated to address their individual social, emotional, and behavioral needs to prevent learning difficulties.

## **Dyslexia Myths**

Despite a growing body of research that has informed our understanding and treatment of dyslexia, many myths about dyslexia persist. Because dyslexia is commonly misunderstood by educators, families, and the public alike, it is important to clarify these misconceptions so we can better identify, teach, and support learners with, or at risk for, dyslexia in and out of school. Figure 2, an excerpt of an infographic from the National Center on Improving Literacy (NCIL), illustrates some key myths about dyslexia.

### **ACTION STEPS**

- Outline talking points to increase staff understanding of how dyslexia aligns with existing laws and literacy priorities, present opportunities for new learning, and commit to ongoing learning for all staff.
- Orient staff to dyslexia (e.g., its definition, causes, characteristics, myths, and facts) by leveraging resources at the end of this section.
- Utilize resources at the end of this section to deepen dyslexia knowledge.

*Figure 2. Understanding Dyslexia: Myths v. Facts. National Center on Improving Literacy, 2020, [improvingliteracy.org](https://improvingliteracy.org). Copyright © 2020 by the National Center on Improving Literacy. Reprinted and adapted with permission.*



# MYTHS VS. FACTS

Breaking down the truth about dyslexia.

## MYTH



## FACT



All students with dyslexia demonstrate the same problems with reading.



Dyslexia is a reading disorder that is based in vision problems, which causes people to read backward or mix up b and d.



People with dyslexia cannot learn to read.



Intelligent people cannot have dyslexia.



Dyslexia exists on a continuum, and students with dyslexia demonstrate different levels of difficulty learning to read.



Dyslexia is a brain-based disorder associated with impairments in the brain regions associated with manipulation of sounds, not vision.



Reading may require significantly more effort and academic support for someone with dyslexia, but these students can learn to read!



Dyslexia impacts individuals with a range of cognitive skills, and with average to above average intelligence. Some individuals with dyslexia have well above average abilities in problem-solving and creativity. However, these above average skills do not exist *because* an individual has dyslexia.



## MORE INFORMATION

- The Gaab Lab, by cognitive neuroscientist Nadine Gaab, cites research that addresses many of the most common dyslexia myths.
- The National Center on Improving Literacy provides an implementation toolkit on Understanding Dyslexia that helps parents and educators learn about dyslexia and how to support the literacy development of students with dyslexia.
- The International Dyslexia Association (IDA) provides a series of Fact Sheets, available in English and Spanish, that address a range of topics, such as Dyslexia Basics, Dyslexia and ADHD, and Dyslexia-Stress-Anxiety Connection.
- Michigan's MTSS Technical Assistance Center hosted a four-part dyslexia series that was recorded and posted to their YouTube Channel. The first session, titled "Understanding Dyslexia," focuses on defining dyslexia in school settings and dispelling common myths and misconceptions.
- In September 2016, the United States Senate passed Senate Resolution 576, which called upon Congress, schools, and state and local education agencies to "recognize the significant educational implications of dyslexia that must be addressed" and designated October 2016 as National Dyslexia Awareness Month.
- In October 2015, the U.S. Department of Education issued a Dear Colleague Letter: Dyslexia Guidance to clarify that there is nothing in the Individuals with Disabilities Education Act (IDEA) that would prohibit the use of the terms dyslexia, dyscalculia, and dysgraphia in IDEA evaluations, eligibility determinations, or Individualized Education Program (IEP) documents.
- Accommodations for Dyslexia by the Tennessee Center for the Study and Treatment of Dyslexia offers a list of commonly adopted accommodations that have been found to help learners with characteristics of dyslexia.

## Chapter 4: Reading Science

### Definition of Reading Science

Reading science, also referred to as the [science of reading](#), is a cumulative and evolving body of evidence proposing explanations about reading development, writing development, and related issues. The evidence is produced from research using scientific inquiry and methods to answer questions by observing, inferring, classifying, predicting, measuring, questioning, and analyzing data. This research spans the last five decades and represents many countries worldwide studying reading development in different languages. It also spans many fields (i.e., cognitive psychology, developmental psychology, education, implementation science, linguistics, neuroscience, school psychology) and, collectively, has contributed to much of what is presently known about literacy. The result is a culmination of evidence that informs how reading and writing skills develop, the sources of reading difficulty, how to assess and teach learners effectively, and how to improve literacy outcomes through a prevention and intervention model (The Reading League [TRL], 2022).

*Reading science, also referred to as the science of reading, is a cumulative and evolving body of evidence proposing explanations about reading development, writing development, and related issues. The science of reading informs what to teach and how to teach reading.*

The science of reading informs what to teach and, to a lesser degree, how to teach reading (Petscher et al., 2020). MDE distinguishes between evidence-based practices and practices informed by scientific reading theories to promote the implementation of practices with the highest levels of evidence of effectiveness. Educators should *use practices that are empirically proven (i.e., have undergone rigorous field testing) to teach children and adolescents to read*. In the absence of empirically proven practices, using literacy

practices that are scientifically informed theories is not necessarily bad. However, it is problematic if scientifically informed theories are being used *instead of* practices that have been empirically proven to be effective.

Evidence-based practices are a set of instructional procedures evaluated using a rigorous experimental design (studies that include independent variables, dependent variables, pretesting, post-testing, experimental groups, and control groups). Teaching learners phonemic awareness with phonics is an empirically proven practice. Although science has not proven one scope and sequence of letter-sound instruction to be the most effective, scientifically informed theories about the best scope and sequence exist (Kim, Petscher, Foorman, & Zhou, 2010; Justice, Pence, Bowles, & Wiggins, 2006). Science has also told us that phonemic awareness skills taught within phonics lessons are predictive of positive reading outcomes (Brady, 2020). Teaching learners to blend and segment phonemes and connect them to letters (graphemes) is an empirically proven practice. Science has not yet revealed whether teaching learners to manipulate (delete, substitute, or reverse) phonemes in spoken and written words is predictive of positive reading outcomes. Instead, readers who perform well on phoneme manipulation tasks do so because it is a “consequence of their reading prowess” (Brady, 2021, p. 2).

Science also informs how we teach decoding, spelling, or orthographic representation of spoken words, such as using an explicit or intentional teaching approach (McLeskey et al., 2017), to support learners whose reading acquisition is not accelerating at a rate commensurate with grade-level expectations. Explicit instruction is an evidence-based practice. One characteristic of a quality phonics lesson is intentionally teaching the orthographic representations of words (Ehri, 2014; Kilpatrick, 2015). Conversely, science has not yet confirmed using a sound wall is predictive of positive



reading or writing outcomes, and the practice is currently being studied. Although using a sound wall is an instructional improvement from using a word wall, its use in primary classrooms has not been empirically validated to be necessary for reading development. Instead, sound walls are considered a scientifically informed theory, since the purpose of a sound wall is to help learners match the articulation of speech sounds (phonemes) to the letters (graphemes) that represent these sounds. It is an instructional tool that can be used to strengthen the neural networks of the brain that are responsible for word recognition. Thus, a sound wall is a scientific theory that, once rigorously studied and shown to be important for reading development, could become an evidence-based practice.

*Prioritize using evidence-based practices to teach children and adolescents to read.*

Importantly, continued reading and writing research will expand what is known about how children learn to read and inform instructional practices. Schools/districts, therefore, should examine, reconsider, and adjust the literacy instructional practices and curriculum resources used to develop skillful readers and writers based on what is scientifically proven now and in the future.

## The Reading Brain

Learning to read does not come naturally (like speaking) because the human brain is not “hardwired” to read written language automatically (Seidenberg, 2017). The writing system, or characters representing spoken language, is a relatively new invention (occurring within the last 5,000 years). Because learning to read is not a natural process, specific instruction is needed. Before discussing instructional methods, it is important to know how various areas of the brain’s left hemisphere typically work together to help learners read and understand print (Kassuba & Kastner, 2015). Understanding the functions these areas of the

brain serve in typical reading development can help explain why research evidence emphasizes teaching specific reading skills, using particular instructional approaches, assessment practices, and measures.

Several areas within the brain’s left hemisphere serve a specific role in reading. Figure 3 is an image of the reading brain showing the parts of the left hemisphere responsible for working together to make reading possible. Because the human mind is very complex, the information presented here is intentionally simplified for ease of illustration. Nuances of the reading brain are not discussed.

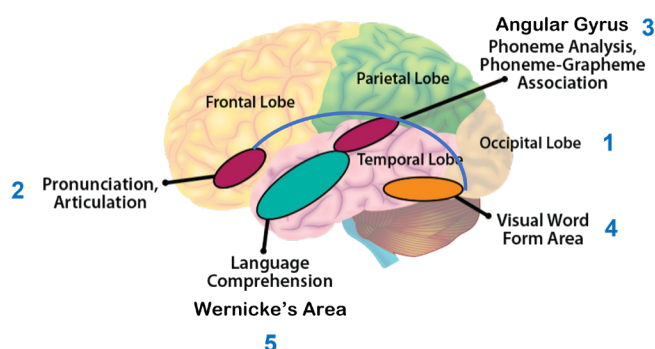


Figure 3. *The Reading Brain*. Moats, L. C., & Tolman, C. A. *LETRS* (3rd ed.). © 2019 Voyager Sopris Learning. All rights reserved. Reprinted and adapted with permission.

1. When a person reads, the print on the page goes through the eyes and travels into the brain’s Occipital Lobe, allowing a person to see the letters and letter patterns of written words. The Occipital Lobe is the area of the brain that processes the letters and letter patterns of our language.
2. Once a learner sees the printed information, the information travels to various regions, including the Frontal Lobe, a part of the brain that has a memory trace for the speech sounds of spoken language. The Frontal Lobe is where the brain houses the speech-sound system.
3. A “bridge,” sometimes referred to as the Angular Gyrus, is located between the Frontal Lobe and the Occipital Lobe. The Angular Gyrus is needed so learners can seamlessly associate the sounds (phonemes) of spoken language with the combinations of letters (graphemes) represented

in print. These three areas of the brain for a beginning reader (Frontal Lobe, Occipital Lobe, and Angular Gyrus) are responsible for phoneme-analysis and phoneme-grapheme association, and they need to work together.

4. The Visual Word Form Area of the brain is also referred to as the Occipitotemporal Lobe, or the brain's "letterbox" (Dehaene, 2013). It helps form memory traces of words and their specific letter strings, so words can be read automatically and effortlessly as if by sight. Trauma to this area of the brain could result in a person not being able to recognize a single word.
5. Wernicke's Area is located within the Temporal Lobe and is responsible for understanding spoken language. Trauma to this area of the brain can result in difficulty understanding language and fluent speech that is content-empty (e.g., vague or nondescriptive words like "thing").

### The Reading Brain for a Beginning Reader versus an Experienced Reader

Beginning readers do not have much activation pattern among the occipitotemporal gyrus (Kearns, Hancock, Hoeft, Pugh, & Frost, 2019) because they have not necessarily learned all the letter names or developed enough phonemic awareness. They may not have learned the connection between the sounds of spoken language and the letters representing those sounds to form words (activating the Angular Gyrus). Explicit instruction in phonemic awareness, letter-sound associations, and decoding increases the activation pattern within these three parts of the brain so they can communicate with one another automatically. As this communication occurs, a memory trace begins to form for words and their specific letter combinations within the Visual Word Form Area (Figure 3, number 4) of the brain's left hemisphere. This memory trace allows learners to read words as if they are reading them by sight, meaning there is instant and effortless recognition of regular and irregular words in print as the brain quickly processes their letters and sounds. Therefore, sight word learning is based

on strong phonemic awareness, phonics, and spelling skills, not visual memory (Ehri, 2014). An active Visual Word Form Area of the brain is an indicator of an experienced reader.

*Sight word learning is based on strong phonemic awareness, phonics, and spelling skills, not visual memory.*

### The Reading Brain and Dyslexia

Neuroimaging research (using noninvasive technology to obtain brain images) has helped advance our understanding and treatment of dyslexia. Studies of the left hemisphere of the brain have detected different activation patterns among the occipitotemporal gyrus (the area responsible for phoneme-grapheme associations) of learners identified with dyslexia and individuals without dyslexia (Centanni et al., 2019; Wang et al., 2017). For individuals identified with dyslexia, individualized, intensive reading intervention focused on phonemic awareness integrated with phonics instruction should strengthen the neural networks connecting these three areas of the brain. The instruction needs to be intentional and explicit, because research has consistently demonstrated this type of explicit instruction is more effective than incidental instruction (Hughes, Morris, Therrien, & Benson, 2017; Swanson & Deshler, 2003). Chapter 5 will provide more information about class-wide reading instruction and intervention to influence the activation patterns for the parts of the brain responsible for word recognition.

*Individuals identified with characteristics of dyslexia or diagnosed with dyslexia benefit from intensive reading intervention that integrates explicit instruction in phonemic awareness and phonics.*

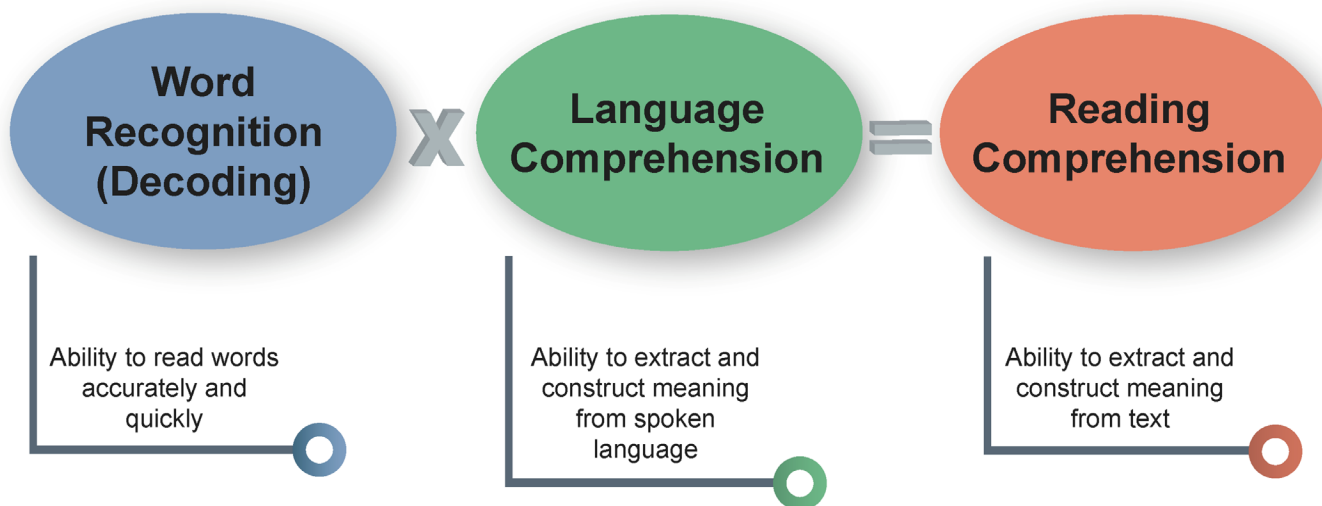


Figure 4. *The Simple View of Reading.* (Adapted from Gough & Tunmer, 1986; Hoover & Gough, 1990; Tunmer & Hoover, 2019.)

### Typical Reading Development Informed by Reading Science

The Simple View of Reading (Gough & Tunmer, 1986; Hoover & Gough, 1990; Tunmer & Hoover, 2019) is an empirically studied theoretical framework used to help educators and leaders understand typical reading development aligned to reading science and better detect reading skills and processes that may be contributing to students' reading difficulties. Reading approaches based on the Simple View of Reading help students with characteristics of dyslexia because they address the reading skills and processes necessary for proficient reading and are often structured to facilitate phonological processing, which is typically weak in these students. Research studies have yielded the same result suggested by the framework: reading comprehension is the product of printed word recognition (decoding/phonics) and language (linguistic) comprehension. Because this framework is a multiplicative explanation for how reading comprehension cognitively develops, both parts (word recognition and language comprehension) are necessary for reading comprehension and require explicit instruction. The multiplicative nature of the equation explains that if either word recognition or language comprehension is diminished or absent, reading comprehension cannot be achieved.

Importantly, the Simple View of Reading is not simplistic. Both parts of the equation (word recognition and language comprehension) are made up of multiple component skills and processes that interact and are interdependent with one another (Tunmer & Hoover, 2019). Word recognition encompasses alphabetic coding skills, print concepts, letter knowledge, phonemic awareness, and understanding of the alphabetic principle. Language comprehension encompasses linguistic knowledge, background knowledge and inferencing skills, phonological knowledge, syntactic knowledge, and semantic knowledge (vocabulary). The increasingly effortless interaction within both parts, and their component skills and processes, produces reading comprehension. The two parts of the Simple View of Reading account for upwards of 95% of the variance in reading comprehension (Lonigan, Burgess, & Schatschneider, 2018). Nevertheless, the Simple View of Reading acknowledges the influence of text characteristics (e.g., text difficulty, sentence complexity), as noted in Francis, Kulesz, & Benoit, 2018, and instructional task demands by teachers on students' reading comprehension (Gough, Hoover, & Peterson, 1996, as cited in Catts, 2018). However, the impact that cognitive reading skills (i.e., the Simple View of Reading) and text and tasks have on reading comprehension have rarely been empirically and rigorously studied together (Catts, 2018).



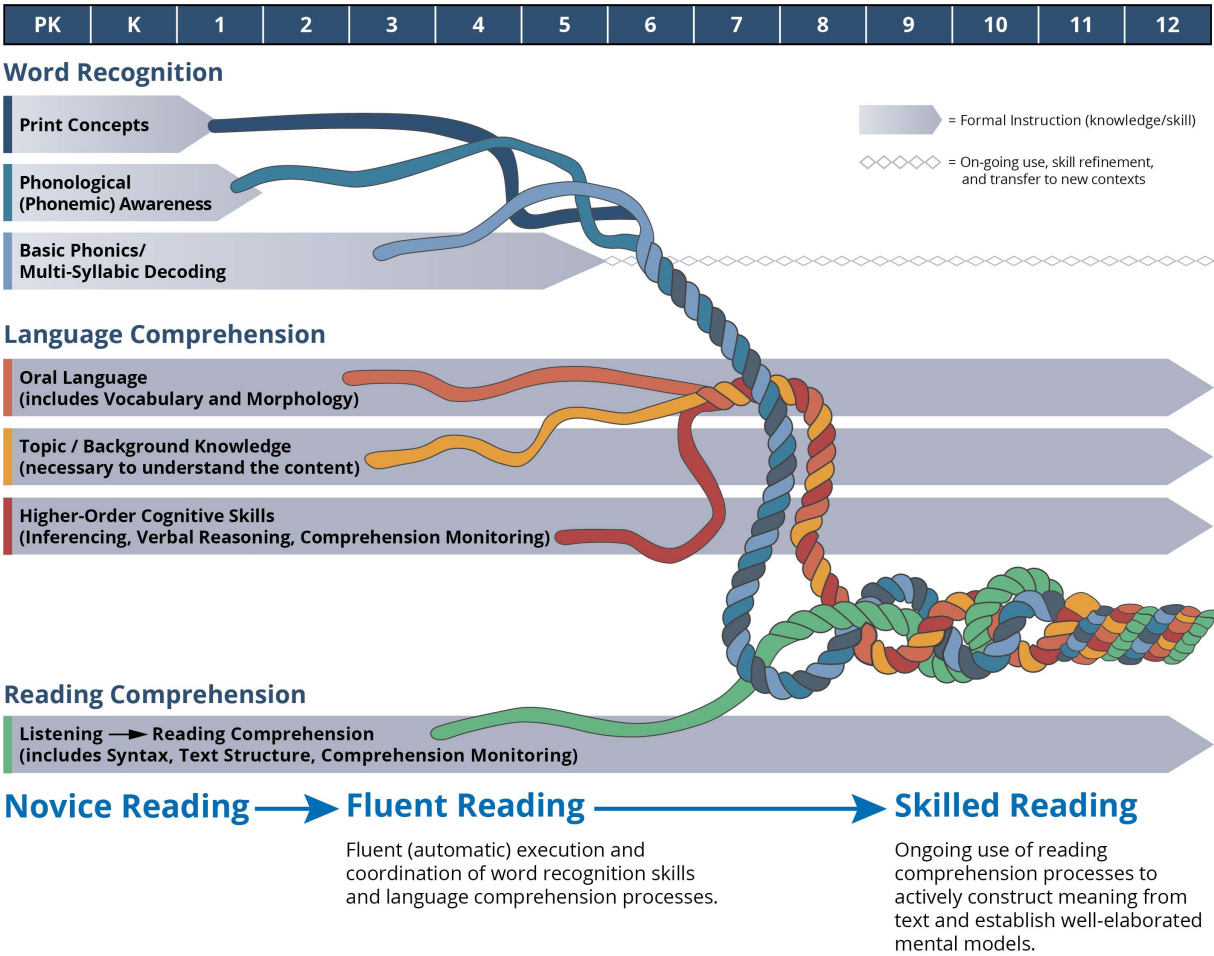
While the process of learning to read is complex, the multiplicative explanation of the Simple View of Reading is straightforward, thereby making it more recognizable and easily understood by educators and leaders who seek to align instructional practices and assessments to reading science. Its simplicity, though, is not intended to hide the multidimensional nature of reading development and subsequent instructional implications. Instruction must effectively integrate word recognition and language comprehension to support reading comprehension (Castles, Rastle, & Nation, 2018; Petscher et al., 2020). However, specific component skills of word recognition and language comprehension in the Simple View of Reading are more relevant at different developmental periods (e.g., more emphasis on word reading initially and less emphasis over

time as learners develop more sophisticated and complex word reading abilities) and may require different levels of attention for certain learners (e.g., added emphasis on language comprehension for English learners) (Cho, Capin, Roberts, Roberts, & Vaughn, 2019).

*While the process of learning to read is complex, the multiplicative explanation of the Simple View of Reading is simple, thereby making it more recognizable and easily understood by educators and leaders who seek to align instructional practices and assessments to reading science.*

Figure 5 is a theory-supported heuristic, or mental shortcut (derived from Hollis Scarborough’s Reading Rope, 2001), intended to support understanding of the learning progression for developing skilled readers

Figure 5. Reading Learning Progression. St. Martin et al. (2022). Intensifying Literacy Instruction: Essential Practices, 2nd Edition. MiMTSS Technical Assistance Center, Michigan Department of Education.



based on the Simple View of Reading. It represents typical reading development and identifies the component skills and processes of word recognition, language, and reading comprehension that require instruction, starting with a novice reader who is just beginning to learn how oral language is represented in print. Next, the learner becomes a fluent reader who, through effective instruction, has developed automaticity in coordinating word recognition skills with oral language and reading comprehension processes. Then, skilled readers use reading comprehension processes to actively construct meaning from written text and establish mental models or overall representations of the text. Mental models are a result of learners interacting in multiple ways with the information within the text and integrating that information to create an enduring understanding of the concepts.

The Reading Learning Progression spans pre-kindergarten through 12th grade. It includes a combination of easy to complex skills and processes implicated in word recognition and language comprehension, leading to learners' ability to effectively comprehend the text they read. All of the component skills for word recognition, and processes for language comprehension and reading comprehension are represented by a shaded bar that is placed within a specific grade-level band. Each bar represents an evidence-based estimate for when typical learners either master these skills or when instruction occurs. Basic phonics/multi-syllabic decoding is a component skill that includes a thin line spanning through 12th grade. The thin line represents the ongoing use, refinement, and generalization of phonics skills as needed. Conversely, language comprehension and reading comprehension continue to be taught across learners' educational careers.

To support skilled reading for all learners, but especially those with characteristics of dyslexia, reading instruction should focus on the structure of our language system. This structure includes the word recognition skills and language and reading comprehension processes represented in the Reading Learning Progression that are implicated in reading difficulties. It is not only important to consider what to teach (e.g., the structure of our language system) but also how to teach (e.g., effective delivery features). Structured Language and Literacy (SLL) (also referred to as Structured Literacy, coined by the International Dyslexia Association) is an umbrella term to describe reading approaches that focus on teaching the structure of our language system using effective delivery features to advance literacy skills for all learners, including students with dyslexia characteristics. SLL emphasizes the structure of language across the speech-sound system (phonology); the writing system (orthography); the structure of sentences (syntax); the meaningful parts of words (morphology); the meaning of words, phrases, sentences, and text (semantics); and the process of oral and written discourse. Explicit teaching is fundamental to SLL, and it incorporates instruction that is sequenced from simple to complex (systematic), builds off previously learned skills (cumulative), includes many opportunities for learners to respond to instructional activities (interactive), and is based on the ongoing use of assessment data (diagnostic).

*To support skilled reading for all learners, but especially those with characteristics of dyslexia, reading instruction should focus on the structure of the language system. This structure includes the word recognition skills and language and reading comprehension processes represented in the Reading Learning Progression that are implicated in reading difficulties.*

There are some myths and misunderstandings associated with SLL that are worth clarifying. First, SLL is an instructional approach, not a

commercial reading program. Second, it is not focused solely on teaching decoding (phonics) but on all components of our language system. SLL supports the explicit teaching of all the word recognition skills, language comprehension processes, and reading comprehension processes outlined in Figure 5. Lastly, it is appropriate to use with all learners, not only with students identified with dyslexia characteristics or specific reading and writing disabilities. In SLL, the decoding (phonics) instruction is a synthetic approach where students learn sounds for letters and common letter patterns at the phoneme level (e.g., /sh/ and /ch/ are two letters that represent one phoneme). The more advanced decoding stages have learners attend to larger patterns in words (e.g., /igh/, inflectional endings, roots, prefixes). Teachers use explicit instruction and purposefully select examples to embed in their phonics lessons, design tasks for learners to demonstrate their understanding, and use phonetically controlled texts to support the generalization of the decoding skills.

### **Language and Literacy Development for English Learners with Dyslexia**

When considering dyslexia and English Learners (ELs), it is important to remember dyslexia is a neurobiological (human) condition that cannot be identified in the absence of a student's response to effective phonologically oriented instruction connecting speech to print. In addition, identifying dyslexia in ELs requires eliminating the possibility that a student's English reading difficulties are due to lack of English proficiency. ELs run the risk of disproportionate identification for learning disabilities due to educators inaccurately distinguishing lack of English proficiency from other possible factors to explain poor progress in reading development.

Dyslexia can affect anyone attempting to decode a printed alphabetic language (and perhaps a logographic language as well), including learners having difficulty learning English (Mishran & Shah, 2016). ELs are a

rapidly growing population of students in U.S. schools, representing varying backgrounds, whose native language is not English. Spanish-speaking ELs represent approximately 80% of this multilingual learner population, with Arabic speakers being the second-largest segment at 2.3% (Cardenas-Hagan, 2020). Too often, schools have difficulty implementing evidence-based practices to effectively meet the literacy needs of ELs. Consequently, ELs are at an increased risk of dropping out of and not graduating from high school. In fact, ELs are nearly twice as likely to drop out of school relative to their non-Hispanic, white peers (Cardenas-Hagan, 2020), and more likely to be identified as having a specific learning disability and speech and language impairment (NCER and NCSER, 2021). To prevent these outcomes, schools must provide the needed instruction to ELs so they may achieve high levels of language and literacy skills. Teachers who understand the Simple View of Reading combined with intensive and intentional English language development (ELD) for ELs and evidence-based literacy practices can accelerate ELs' language and literacy outcomes. For example, teachers can help emerging and developing ELs understand the meaning of words and text (ELD) as they learn to read. As ELs use their word recognition skills to read, they can confirm their phonics and decoding accuracy by referencing meaning. Moreover, ELD instruction for ELs should also focus on the words and text being used to teach them foundational reading skills (Goldenberg, 2020). As grade levels increase, the needed ELD support for ELs grows exponentially, as does the complexity and demand of the language in which they are expected to read (and write).

Although the basic tenets of reading science and the neurobiological basis for learning to read are consistent among learners whose native language is or is not English, these precepts alone are insufficient for supporting ELs in their reading development and determining the presence of dyslexia (Mancilla-Martinez & Lesaux, 2011). One of the first steps to identifying dyslexia in ELs is to assess their ability to



manipulate speech sounds in their native language (phonemic awareness). Research has suggested ELs with low-level phonemic awareness skills in their native language will have difficulty learning a new language (Mishran & Shah, 2016). Another step is to administer additional assessments for oral reading and spelling, especially if the EL's native language is classified as a "transparent language," meaning sound-symbol correspondences are predictable, with one sound representing one symbol (letter) (Moats & Tolman, 2019). Issues with oral reading fluency and spelling in ELs' native language can be indicators of dyslexia for ELs whose native language is transparent. Dysfluent reading, however, can also be a result of ineffective reading instruction. To fully support ELs in their reading development, including those with characteristics of dyslexia, educators need to provide more extensive language support in word recognition, decoding, and language comprehension skills to ensure adequate understanding of discipline-specific information (Williams & Martinez, 2019).

Since many states' dyslexia legislative efforts are focused on the primary challenges associated with dyslexia (decoding and word recognition skills), it is important for educators and leaders supporting ELs to access additional resources to understand how to effectively teach multilingual learners to read. For example, research has demonstrated positive outcomes for first-grade ELs when language modifications were added to a reading intervention to make its contents more understandable and coupled with oral language and vocabulary development activities (Vaughn et al., 2006). Such research illustrates the importance of teaching ELs foundational reading skills and ELD together to help them understand the meaning of words and text. To build upon the individual assets of ELs, educators can incorporate ELs' knowledge of their native language to support the development of English (Cardenas-Hagan, 2020). See the resources included at the end of this section for additional information.



## Language, Reading, and Behavioral Characteristics That Could be Indicative of Dyslexia

Table 1. Potential Reading Difficulties by Grade-Level Bands.

Grade Level	Language, Reading, and Behavioral Characteristics That Could be Indicative of Dyslexia
<b>Preschool</b>	<ul style="list-style-type: none"> <li>• Talks later than most children who are the same age</li> <li>• Deletes initial or final speech sounds in words</li> <li>• Stutters</li> <li>• Recognizes a limited number of letter names, colors, or shapes after being provided with quality instruction</li> <li>• Forgets words that were thought to be a part of an existing oral vocabulary</li> <li>• Needs support in following multi-step directions or following common routines</li> <li>• Has trouble recognizing and producing rhyming words</li> </ul>
<b>Kindergarten -3rd Grade</b>	<ul style="list-style-type: none"> <li>• Associates only a few letters with sounds</li> <li>• Confuses letters whose sounds are similar (e.g., p/b, t/d, f/v)</li> <li>• Needs significantly more support than grade-level peers in taking apart the individual sounds in words and putting sounds within words together to say the whole word</li> <li>• Incorrectly reads words without attention to the sounds of the letters within the words after related instruction has been provided</li> <li>• Guesses at unknown words</li> <li>• Skips or misreads prepositions</li> <li>• Ignores suffixes</li> <li>• Relies on picture and context cues to compensate for the inability to easily attend to the word's letter-sound associations</li> <li>• Acquires reading skills at a slower rate than grade-level peers</li> <li>• Verbalizes difficulties in learning to read</li> <li>• Avoids reading-related activities (e.g., reading aloud, participating in reading activities with peers, independent reading at home)</li> <li>• Repeatedly misspells words that include letter-sound combinations that have been taught</li> <li>• Finds handwriting to be difficult (e.g., pencil grip, letter formation)</li> <li>• Has difficulty finding the correct word when speaking</li> </ul>
<b>4th – 12th Grade</b>	<ul style="list-style-type: none"> <li>• Demonstrates significant difficulties when trying to read and spell multi-syllable words</li> <li>• Attempts to read multi-syllable words by starting to read the word in parts (syllables) but then guesses without attending to the remaining word parts</li> <li>• Unaware of meaningful parts of words (morphemes) to support accurate word reading and understanding the meaning of words</li> <li>• Finds it challenging to understand new information from text because of underlying decoding and word recognition issues</li> <li>• Finds it challenging to understand text because of underlying oral language difficulties that impact understanding the vocabulary and syntactic patterns of sentences</li> <li>• Demonstrates limited vocabulary</li> <li>• Lacks written expression skills compared to grade-level peers</li> <li>• Experiences difficulty learning a foreign language</li> <li>• Avoids reading and writing activities at school and home</li> </ul>

## Science of Reading and Instructional Implications

The large body of evidence about reading development and literacy-related issues that constitutes the science of reading must inform the selection of instructional methods, curriculum resources, and assessment practices. Too often, research is used to justify a previous literacy-related decision (e.g., supporting the purpose of a particular curriculum resource, funds spent on sending educators to a long-term literacy professional development series) instead of to inform an upcoming literacy-related decision. Empirically sound decisions about how a district will invest its resources for reading and writing should not be made through happenstance.

Sifting through a large body of scientifically based research may seem daunting. Thankfully, such quality and reputable resources as the Institute for Education Sciences (IES) Practice Guides provide educators and leaders with the best research evidence available to support reading and writing development, among other areas. Additionally, the IES Practice Guides combine expert and practitioner knowledge to apply the research recommendations in classroom settings and address common implementation challenges. Districts and schools that use a sound process based on reviewing research to evaluate and select literacy-related instructional materials and methods will be better equipped to respond to inquiries and address implementation missteps. Subsequent sections of this guidance provide more information about selecting and successfully supporting the use of evidence-based curriculum materials, instruction methods, and assessments.

## ACTION STEPS

- Introduce educators and leaders to the definition of the science of reading and ESSA Standards of Evidence. Discuss the concept of “scientifically informed theories” to help understand how, in the absence of evidence-based practices, practices informed by scientific theory are appropriate to use.
- Support understanding of the neurological basis for learning to read (Reading Brain) to recognize why dyslexia legislative efforts focus on the importance of using a code-emphasis approach to teaching all learners to decode.
- Discuss the evidence for the constructs within the Simple View of Reading (Figure 4) that account for approximately 95% of the difference in novice versus expert readers.
- Use the Reading Learning Progression (Figure 5) to help teachers and leaders understand reading acquisition across Pre-K through 12th grade.
- Discuss the potential characteristics of dyslexia and how effective prevention and intervention efforts can change the reading trajectory for learners.



## MORE INFORMATION

### Literacy Evidence-Based Practices:

- [Practice Guide Summaries: Foundational Skills to Support Reading for Understanding in K-3rd Grade](#) (Lead for Literacy)
- [Practice Guide Summaries: Improving Reading Comprehension in Kindergarten Through Third Grade](#) (Lead for Literacy)
- [Practice Guide Summaries: Effective Literacy and English Language Instruction for English Learners in the Elementary Grades](#) (Lead for Literacy)
- [Practice Guide Summaries: Teaching Academic Content and Literacy to English Learners in Elementary and Middle School](#) (Lead for Literacy)
- [Practice Guide Summary: Providing Reading Interventions for Students in Grades 4–9](#) (WWC)
- [Effectiveness of Early Literacy Instruction: Summary of 20 Years of Research](#) (Regional Education Laboratory-Southeast)

### Instructional Methods Evidence-Based Practices:

- [10 Key Policies and Practices for Explicit Instruction](#) (Meadows Center)

### Structured Literacy:

- [Here's Why Schools Should Use Structured Literacy](#) (IDA)

### Reviewing and Evaluating Reading/Language Arts Curriculum Resources:

- [Rubric for Evaluating Reading/Language Arts Instructional Materials for Kindergarten to Grade 5](#) (REL-SE)
- [Curriculum Evaluation Tool](#) (The Reading League)
- [An Explanation of Structured Literacy, and a Comparison to Balanced Literacy](#) (Iowa Reading Research Center)



## Chapter 5: Multi-Tiered System of Supports: A Framework to Meet the Individual Needs and Assets of the Whole Child

A well-implemented Multi-Tiered System of Supports (MTSS) framework should be used to prevent academic, social-emotional, and behavioral difficulties (McIntosh & Goodman, 2016; McIntosh et al., 2008). By attending to the social-emotional/behavioral needs of all learners, while ensuring the use of effective instructional practices, MTSS enables teachers to mitigate learning challenges and maximize instructional time. It should also help identify and support learners with characteristics of dyslexia (Miciak & Fletcher, 2020). MTSS is a comprehensive framework that includes three distinct levels (or tiers) of instructional support. MDE defines MTSS as a comprehensive framework comprised of a collection of evidence-based strategies designed to meet the individual assets and needs of the whole child (academic, social, emotional, behavioral, physical, and mental health). An MTSS framework must include universal screening, Tier 1 (evidence-based, class-wide) instruction, Tier 2 intervention (preventative, targeted intervention, and ongoing progress monitoring for learners who are not responding as anticipated to quality instruction), and Tier 3 supports (intensive intervention supports for learners who are not responding as anticipated to preventative intervention).

*MTSS should be used to prevent academic, social-emotional, and behavioral difficulties. It should also help identify and support learners with characteristics of dyslexia or specific learning disabilities.*

An MTSS framework supportive of academic and social-behavioral outcomes for all learners regardless of learners' identities (e.g., ethnicity, disability, gender, sexual orientation, family background, family income) begins with educators

creating safe, predictable, and engaging classroom environments (Simonsen et al., 2021). Teachers accomplish this in Tier 1 (class-wide) instruction by attending to the physical layout of their classroom and establishing and teaching a small number of predictable classroom routines. Then, it is important for teachers to foster shared understanding and commitment to class-wide, culturally responsive social-emotional/behavioral expectations that create the conditions for maximizing learning opportunities. These expectations should be clearly defined, displayed in the classroom, and taught to all learners. Teachers can embed culturally responsive social-emotional learning competencies within the expectations to promote learners' self-awareness, self-management, responsible decision-making, social awareness, and relationship skills.

To maximize Tier 1 (class-wide) instructional time to develop skillful readers, teachers within and across grade levels can prioritize empirically proven curriculum resources and instructional routines/strategies to teach foundational word reading skills and comprehension. When teachers understand the science of reading, they are better equipped to determine: a) what to teach, b) when, and c) for how long, and to use evidence-based practices necessary for later reading success (Foorman et al., 2016; Foorman & Schatschneider, 2003; Tolman & Moats, 2019).

Subsequent sections of this handbook provide more information about effective class-wide (Tier 1) reading instruction.

### Intensifying Intervention Instruction to Accelerate Reading Outcomes

Learners who require supplemental instruction in smaller, homogeneous groups benefit from more frequent progress monitoring to determine if the supplemental supports are effective (Gersten et al., 2008). Within an MTSS framework, this type of instruction is classified as Tier 2. Interventions provided in Tier 2 are chosen from the school/district intervention platform. An intervention

platform is a collection of practices or programs that have been intentionally reviewed, evaluated, and chosen as the foundation, or building blocks, for customizing intervention (Vaughn, 2019). Some features of quality Tier 2 interventions include:

- Empirically validated curricula materials
- Specialized instructional procedures that outline what learners need to do or say during a lesson
- Concise instructional language
- Teacher modeling of what learners are expected to do during lessons
- Opportunities for learners to demonstrate what they are incrementally being taught during lessons
- Affirmative, corrective, or informative feedback
- Opportunities for individual learners to demonstrate their understanding
- Mechanisms to control for task difficulty while gradually increasing the level of difficulty as learners progress
- Engagement opportunities to maintain learner success and instructional response

Learners who are not responding as anticipated to effective Tier 1 class-wide instruction and Tier 2 intervention would benefit from Tier 3 supports, which provide the most intensive and individualized level of intervention instruction.

***Tier 3 intervention is intended to accelerate reading outcomes for learners in general education before referral to special education and for learners identified with disabilities.*** A multidisciplinary team, comprised of the learner's classroom teacher, interventionist, and staff with different levels of expertise (e.g., reading science, assessment, behavior, speech and language), collectively develops an Individualized Intensive Intervention Plan for the learner. This plan is not synonymous with an Individualized Education Plan (IEP).

The Individualized Intensive Intervention Plan outlines the following:

- Learner information (e.g., name, grade)
- Individuals who developed the plan (including parents, caregivers, teachers, and individuals with reading, assessment, and behavioral expertise to support individual learner needs)
- Goal or focus of the intervention plan, including a target for accuracy (i.e., 80% for new content, 90% for review content)
- Primary intervention that will be used (curriculum resource and additional intervention strategies, if applicable)
- Information about when the learner will receive the intensive intervention instruction (e.g., number of days and time, instructor, location)
- Intervention components found within the intervention curriculum resource
- Proactive adaptations to the intervention components to increase instructional intensity
- Diagnostic assessment data that are collected to generate reasons why the learner is not responding as expected to the intervention instruction
- Intervention instructional adjustments that are incrementally made as progress monitoring data are analyzed (e.g., adjusting the intervention alignment, dosage, comprehensiveness/explicitness, preparing to transfer to class-wide Tier 1 instruction or other contexts, and adjusting behavioral supports)

To effectively support learners with significant and persistent reading needs, it is vital to reduce the number of learners who need Tier 3 intervention. Tier 3 intervention draws upon considerable human, fiscal, and material resources. To be effective, a district/school cannot afford to provide Tier 3 intervention support to many learners. There is, however, strong evidence demonstrating how quality class-wide Tier 1 reading instruction, coupled with solid Tier 2 intervention instruction, reduces the number of learners in need of Tier 3 supports (Foorman et



al., 2016; Al Otaiba et al., 2009; Gersten et al., 2008). Moreover, when schools implement high-quality Tier 1 instruction and Tier 2 intervention, they not only reduce the number of learners requiring Tier 3 intervention but may also reduce the number of special education referrals. In turn, this makes Tier 3 intervention more manageable for schools to implement for learners truly requiring this level of intensity, in both general education and special education settings.

*When schools implement high-quality Tier 1 instruction and Tier 2 intervention, they not only reduce the number of learners requiring Tier 3 intervention but may also reduce the number of special education referrals. In turn, this makes Tier 3 intervention more manageable for schools to implement for learners truly requiring this level of intensity, in both general education and special education settings.*

### **Instructional Principles to Support Students with Characteristics of Dyslexia**

Since dyslexia is a reading disorder primarily characterized by word-level reading difficulties originating from phonological processing weaknesses, assessment data will likely yield a need to provide these learners with both quality Tier 1 class-wide instruction and increasingly intensive intervention in developing phonological skills and word-level reading skills (decoding and spelling words) using a “code-emphasis” synthetic phonics instructional approach. This type of intervention would be classified as Tier 2 or Tier 3 reading intervention supports within an MTSS framework. A code-emphasis synthetic phonics approach involves simultaneously teaching phonemic awareness alongside phonics in lessons. Using this approach means explicitly teaching the code system of written English at the sound, syllable, morpheme, and word level. This approach is most effective in preventing decoding and word recognition difficulties and intervening to accelerate decoding abilities.

A code-emphasis synthetic phonics approach includes the following instructional elements:

- Use an explicit teaching routine encompassing teacher modeling, guided practice, and independent practice
- Focus learners’ attention on speech sounds before focusing on letters (the next component within a phonics lesson described below)
- Encourage “mouth awareness” (ask learners to determine whether their mouths are open or closed, and whether they are using their vocal cords, tongue, teeth, or lips when they make the sound)
- Include instruction in all the English phonemes; however, align the phoneme instruction with the graphemes that are the focus of the next part of the lesson
- Engage learners’ hands, eyes, and mouths when possible
- Be brief
- Provide immediate affirmative and corrective feedback

Quality phonics and word recognition lessons using a code-emphasis synthetic phonics instructional approach should use an explicit instructional routine, like the one outlined in the IES/NCEE’s Regional Educational Laboratory–Southeast Evidence-Based Teaching Practice (2019), and include the following components:

- Purpose or goal of the lesson
- Practice in phonemic awareness (see above)
- A brief review of the previous lesson
- Introduction of the new concept
- Guided practice opportunities
- Extended practice opportunities
- Dictation practice
- Connections to word meaning
- Text reading by reading decodable sentences and passages (text includes many words containing the letter-sound associations and high-frequency words that were the focus of instruction)

*A code-emphasis synthetic phonics instructional approach means explicitly teaching the code system of written English at the sound, syllable, morpheme, and word level. This approach is most effective in preventing decoding and word recognition difficulties and intervening to accelerate decoding abilities.*

Importantly, the evidence-based programs and practices used to develop learners' phonological and word-level reading skills are not expected to be developed by individual teachers. Designing effective intervention materials requires significant expertise in the content area, instructional design principles, and learning science. It also requires a considerable amount of time, which teachers often do not have, given their daily responsibilities. For this reason, district leaders, in collaboration with individuals knowledgeable about literacy (e.g., reading science), need to engage in a thorough intervention review, evaluation, and selection process. A quality review and selection process helps ensure schools have carefully designed, systematic interventions for learners who have instructional needs beyond what can be met through Tier 1 instruction. The document "Intensifying Literacy Instruction: Essential Practices" outlines additional methods to review and select high-quality intervention resources.

*District leaders, in collaboration with individuals knowledgeable about literacy (e.g., reading science), need to engage in a thorough review, evaluation, and selection process to ensure schools have carefully designed, systematic interventions for learners who have instructional needs beyond what can be met through Tier 1 instruction.*

## **Effective Elementary Class-Wide (Tier 1) Reading Instruction**

Effective class-wide literacy instruction must be designed to prevent reading difficulties and meet all learners' needs, including those with characteristics of dyslexia or with specific disabilities. Teachers can accomplish preventing reading difficulties when they attend to both decoding and word recognition skills (also referred to as foundational word reading skills) and comprehension processes that are appropriate for their specific grade levels, given the learning progression for developing skilled readers (Figure 5). For example, kindergarten teachers should provide daily instruction in print concepts and phonemic awareness skills that are supportive of the letter-sound associations taught during daily phonics lessons. Instruction in these foundational word reading skills is most effective for the range of learners in the classroom when it is explicit. This means, throughout lessons, the teacher incorporates modeling, uses concise instructional language, and provides opportunities for learners to practice with instructional feedback. Explicit instruction also includes opportunities for learners to have sufficient independent practice, distributive practice, and cumulative review of reading skills being learned.

### ***Changing Instructional Emphasis for Decoding and Word Recognition Skills***

As learners progress from kindergarten to third grade, the instructional emphasis shifts (Figure 5). For example, foundational word reading skills such as print concepts fade at the beginning of first grade and phonemic awareness instruction fades beyond first grade. Additionally, word reading skill complexity increases across the grades, such as letter-sound combinations (grapheme types), syllable types, and orthographic rules (e.g., consonant doubling, changing "y" to "i" when adding suffixes) that learners are expected to know. Text should be judiciously used to support the application of

word reading skills learned across these grades. Decodable text would be appropriate if it allows learners to practice recently taught decoding and word recognition skills and reflects the lesson's purpose. Although learners with characteristics of dyslexia will often require additional intervention supports to develop their decoding and word recognition skills, attending to their comprehension cannot be overlooked, because comprehension difficulties are a secondary result of dyslexia (Snowling, Hayiou-Thomas, Nash, & Hulme, 2019).

*Although learners with characteristics of dyslexia will often require additional intervention supports to develop their decoding and word recognition skills, attending to their comprehension processes cannot be overlooked, because comprehension difficulties are a secondary result of dyslexia.*

### **Developing Comprehension**

Unlike foundational word reading skills, comprehension processes are developed throughout a learner's educational career. While the complexities associated with comprehension shift over time, the instructional emphasis on developing vocabulary and background/topic knowledge to support inferencing, understanding syntactically complex sentences and text structure, and monitoring comprehension is ongoing. Comprehension processes are developed by using quality texts that differ in complexity, genre, and format. Quality texts for developing comprehension include those that advance learners' science, social studies, and mathematics understanding; reflect learners' backgrounds and identities; include critical academic vocabulary; align to individual learner needs; and increase in complexity through scaffolded instruction.

Teachers should read aloud daily to advance learners' comprehension, especially in the early elementary grades (NICHD, 2010; WWC, 2007). This allows young learners to focus their full cognitive attention on understanding the text

as opposed to decoding words, since they are still learning word recognition skills and how to decode independently. Reading aloud to support comprehension processes is common in the elementary grades and can be beneficial in later grades, depending on the circumstance. Individual learner differences should inform whether reading aloud or having learners individually or jointly read text is an appropriate instructional decision. In short, learners should be exposed to a range of diverse text with more scaffolded instruction provided in harder to understand text.

### **Effective Secondary Class-Wide (Tier 1) Instruction**

In middle and high school, continuing to develop learners' reading and writing skills should occur while teaching core subject areas (i.e., English language arts, math, science, and social studies) (Herrera, Truckenmiller, & Foorman, 2016; McCulley & Osman, 2015). Integrating reading and writing into the disciplines not only aids learners in further understanding the content being taught in classes, but also provides practice opportunities to read and demonstrate critical thinking in diverse text. Unfortunately, there is not enough reading practice happening in secondary settings to accelerate reading acquisition. Studies have found secondary learners read text approximately four minutes per class period (Swanson, Wanzek, & Vaughn, 2016). This is not enough time for learners to engage with syntactically complex sentences, robust content-specific vocabulary, and a variety of text structures to support understanding of core subject area information, and for those who require practice opportunities to further develop reading skills. Secondary teachers, therefore, should carefully select text and provide appropriate time during class for learners to read and discuss it to enhance learners' understanding of core subject area information.



*In middle and high school, continuing to develop learners' reading and writing skills should occur while teaching core subject areas. Integrating reading and writing into the disciplines not only aids learners in further understanding the content being taught in classes, but also provides practice opportunities to read and demonstrate critical thinking in diverse text.*

### ***Before, During, and After Reading Disciplinary Text***

In addition to incorporating text into core subject areas, it is equally important for secondary teachers to teach learners how to gain meaning from the text (Goldman, Snow, & Vaughn, 2016). Teachers can accomplish teaching learners how to gain meaning from the text by designing and delivering daily lessons that consider what learners need to know and be able to do before, during, and after reading to support a deeper understanding of core subject area content. For example, before reading, a social studies teacher could activate learners' background knowledge necessary for understanding the concepts and guide them in previewing critical text information. Next, the teacher could explicitly teach critical vocabulary necessary for understanding the information. For learners with difficulties reading, the teacher could highlight how to decode multi-syllable words that they will encounter. The instructional strategy/instruction routine used to decode multi-syllable words can be the same strategy/instructional routine used during intervention class. Consequently, there should be regular communication and coordination between secondary teachers and interventionists to promote instructional consistency. Secondary teachers who model the use of intervention strategies in core-subject classes support learners' ability to generalize these skills to other contexts. Finally, before reading text, secondary teachers should establish a clear reading purpose.

During reading, secondary teachers can actively guide class-wide understanding of the text by using a variety of passage-reading procedures to ensure learners are meaningfully engaging with the text, such as having the class read a portion of the text aloud with the teacher (choral reading) or pausing to have the class supply the next word when the teacher is reading (cloze reading) (Capin & Vaughn, 2017). Other passage-reading procedures include partner reading or independent reading, with the teacher monitoring to ensure everyone is reading. For instance, the teacher can stop and listen to learners individually whisper-read as he or she walks by. These passage-reading procedures not only ensure reading is occurring in core subject areas, but also increase the amount of time learners are reading. Additionally, the teacher should ask text-dependent questions and provide opportunities for learners to generate questions about the text themselves and answer questions generated by peers (Kamil et al., 2008; Stevens, Murray, Fishstrom, & Vaughn, 2020).

*In addition to incorporating text into core subject areas, it is equally important for secondary teachers to teach learners how to gain meaning from text. Teachers can accomplish teaching learners how to gain meaning from the text by delivering daily lessons that consider what learners need to know and be able to do before, during, and after reading to support deeper understanding of core subject area content.*

After reading, teachers can have learners demonstrate their understanding of the text by summarizing key concepts, analyzing information read, and connecting ideas to other areas of core-subject learning. When secondary teachers provide quality instruction and scaffolding before and while learners engage with subject-specific text, they create the conditions for effective comprehension (Capin & Vaughn, 2017; Kamil et al., 2008). As a result, it becomes clearer to the teacher when class-wide or individual learner understanding breaks down and what steps to take to effectively intervene.

## Universal Screening: Identifying Learners with Characteristics of Dyslexia

Universal screening is a process used to systematically assess all learners on academic, social, emotional, behavioral, or mental health indicators. It is one of four different types of assessments (Table 2) used within an MTSS framework to ensure positive outcomes for all learners. Additionally, experiential assessments can enhance performance assessments by examining the degree to which school-wide practices are equitable to all learners and families/caregivers. Universal screening in reading is a critical first step in determining if learners are on track to achieve reading milestones for their grade level. There is broad consensus in research for schools to implement universal screening in reading for all learners in the early elementary grades to identify who may be at risk for future reading difficulties and to intervene early, when the probability is greatest to close the opportunity gap (Petscher et al., 2019).

*Universal screening is a process used to systematically assess all learners on academic, social, emotional, behavioral, or mental health indicators.*



Table 2. Assessment Types.

Assessment Type	Purpose	Question	Characteristics
Screening	To identify learners who need further evaluation of skills as well as those who are expected to perform adequately or in an accelerated fashion on a summative assessment	Who needs additional support?	<ul style="list-style-type: none"> <li>• Brief</li> <li>• Standardized administration and scoring procedures</li> <li>• Reliable and valid</li> <li>• Linked to progress monitoring assessment system to facilitate score comparisons and increase assessment system efficiency</li> </ul>
Progress Monitoring	To determine how well learners are responding to instruction	How effective is the support?	<ul style="list-style-type: none"> <li>• Brief</li> <li>• Standardized administration and scoring procedures</li> <li>• Alternate forms of assessment of same level of difficulty</li> <li>• Reliable and valid</li> </ul>
Diagnostic	To provide specific information about a learner's strengths and weaknesses and need for instructional support in specific skill areas	Why is the support not as effective as anticipated? How should intensive support be focused to meet the learner's individual needs?	<ul style="list-style-type: none"> <li>• Longer to administer</li> <li>• Standardized and non-standardized</li> <li>• Criterion-referenced</li> <li>• Administered when more in-depth or reliable information is needed about the learner's strengths and weaknesses or to inform instructional planning</li> </ul>
Experiential	To provide systematic information about how students and parents/caregivers feel about the learning environment	What changes can the school make to ensure the learning environment is equitable and inclusive for students, parents/caregivers?	<ul style="list-style-type: none"> <li>• Non-numerical (qualitative data)</li> <li>• Artifacts, stories/narratives, and observations are used to understand the experiences of students, parents/caregivers in schools</li> </ul>
Summative	To evaluate learners' performance relative to a set of content standards	Was the support effective?	<ul style="list-style-type: none"> <li>• Standardized</li> <li>• Norm-referenced</li> </ul>



## *Screening Assessment Selection Considerations*

The purpose of a universal screening assessment is to identify students who might be at risk for future reading difficulties. Universal screening assessments should have strong technical adequacy, or published evidence for reliability, validity, and classification accuracy to the best extent possible (Gersten et al., 2008; Petscher et al., 2019). Validity refers to the extent to which an assessment measures what it is intended to measure. Reliability refers to the extent to which an assessment measures consistently and produces stable results across time (see the More Information section). In addition to being valid and reliable, universal screening assessment measures should be brief and easy to administer, timely so as not to delay access to instructional supports, and informative (Fletcher, Francis, Foorman, & Schatschneider, 2021; Gersten et al., 2008). For reading, these screening assessments should assess major areas of reading development to identify learners at general risk for reading difficulties. Screening data are validated and then used in collaboration with other data to make decisions about learners in need of intervention support. Together, they should provide teachers with useful information about learners' assets and individual needs. Assessment review guidance is available to assist districts in being good consumers of screening assessments. For example, the National Center for Intensive Intervention (NCII) has organized high-quality review information for academic and behavioral assessment tools (see the More Information section for assessment tools selection guidance). District leaders will still need to consider implementation costs, available resources, and additional resources needed for implementation prior to making assessment decisions.

The purpose of a dyslexia screening assessment is to identify students who might be at risk for dyslexia. Although universal screening in reading is different from screening for dyslexia risk, the same technically adequate screening measures

can often be used, but with adjustments and different considerations. However, it is important that these formal measures are validated for use as dyslexia screening assessments. When screening learners for characteristics of dyslexia, certain dyslexia screening assessment measures are indicative of the skill patterns characteristic of dyslexia. Other sources of data, like from informal spelling measures and teacher observations, should be included in the screening process and can verify screening results. Since spelling and reading are complementary processes, analyzing spelling errors from spelling screeners offers insight into both spelling and reading development (Hirschmann, Farris, Alexander, Flipse, & Odegard, 2021). Table 3 names the measures for specific grades or grade-level bands that, at minimum, are beneficial for identifying these learners. Rapid Automated Naming (RAN) is a skill that is often measured as part of a battery of assessments outlined in states' dyslexia legislative efforts. However, there is not strong evidence that RAN uniquely predicts dyslexia risk beyond code-based measures of letter naming and phonemic awareness. It is important to follow assessment measure administration and scoring guidance from the test developers. Lastly, it is not appropriate to use screening results to formally diagnose whether a learner has dyslexia but screening results can be used to identify learners who have difficulty in the foundational skills characteristic of dyslexia (Petscher et al., 2019). For those identified as having difficulty in the foundational skills characteristic of dyslexia (through the dyslexia screening assessment), diagnostic assessments are used to determine and match the instructional focus of intervention supports and related services to learner needs.

*Validity refers to the extent to which an assessment measures what it is intended to measure.*

*Reliability refers to the extent to which an assessment measures consistently and produces stable results across time.*

*Table 3. Early Elementary Screening Assessment Measures for Identifying Learners with Characteristics of Dyslexia.*

Grades	Screening Assessment Measures
Pre-Kindergarten	<ul style="list-style-type: none"> <li>• Oral language and vocabulary</li> <li>• Phonological awareness</li> <li>• Alphabet knowledge</li> </ul>
Kindergarten	<ul style="list-style-type: none"> <li>• Oral language and vocabulary</li> <li>• Letter knowledge</li> <li>• Phonological (phonemic) awareness</li> <li>• Letter-sound associations</li> <li>• Phonological processing task (Rapid Automated Naming assessment measure)</li> <li>• Spelling (end of kindergarten)</li> </ul>
First Grade	<ul style="list-style-type: none"> <li>• Phonemic awareness segmentation task</li> <li>• Phonological processing task (Rapid automated naming assessment measure)</li> <li>• Non-word reading fluency</li> <li>• Word-reading fluency</li> <li>• Oral reading fluency</li> <li>• Spelling</li> </ul>
Second Grade	<ul style="list-style-type: none"> <li>• Word-reading tasks</li> <li>• Oral reading fluency</li> <li>• Spelling</li> </ul>
Third Grade	<ul style="list-style-type: none"> <li>• Oral reading fluency</li> <li>• Spelling</li> </ul>

### ***Upper Elementary and Middle School Screening***

The screening process for learners in the upper elementary grades (e.g., 4th and 5th grade) and middle school looks different than screening in the early elementary grades. It can begin by administering an oral reading fluency assessment two to three times per year that includes comprehension tasks. For learners reading below grade level, fluency assessments may help determine if fluency issues are contributing to breakdowns in their reading comprehension (Petscher et al., 2019). Fluency assessments should be administered as a starting point for determining who is in need of reading intervention supports. Teachers should review this data along with existing information they have for these learners to confirm intervention need (Ford et al., 2018). Depending on the learner's data, additional assessments to inform intervention supports and related services should be administered.

If learners demonstrate any of the following, they should be screened for potential characteristics of dyslexia:

- Avoidance of reading-related activities
- Effortful and laborious reading
- Reading comprehension difficulties associated with inaccurate or inefficient decoding and word recognition abilities
- Spelling or encoding difficulties not associated with fine motor skills
- Low performance on English language arts or other district-approved reading-related assessments

*Screening adolescents for characteristics of dyslexia does not look the same as screening young children.*

### High School Screening

It is possible high school learners may not have historical screening data that assessed their decoding and word recognition skills, which are critical to identifying characteristics of dyslexia. If this is the case, then screening for potential characteristics of dyslexia in high school begins by reviewing existing learner data and information to determine at what grade level the learner is reading to inform accurate reading intervention supports. Typically, school counselors or others who have easy access to this information will take the lead in determining whether learners need additional reading-related supports and services within the school. If learners demonstrate any of the following, they should be screened for potential characteristics of dyslexia:

- Avoidance of reading-related activities
- Effortful and laborious reading
- Reading comprehension difficulties associated with inaccurate or inefficient decoding and word recognition abilities
- Low performance on English language arts or other district-approved reading-related assessments

There are, however, some computer adaptive assessment systems that have validated measures of reading/language for high school that should be used to identify learners for potential characteristics of dyslexia and to inform reading intervention supports (see the NCII resource in the More Information section). Similar to grades 4-8, an efficient screening approach should be used to reduce the number of learners who need more specified reading assessments to determine reading intervention supports (Ford et al., 2018). A subsequent section on “Accelerating Outcomes for Learners with Characteristics of Dyslexia” provides further information about how to find time to provide reading intervention supports for high school students and how to provide quality reading intervention instruction that accelerates outcomes.

### Assessment System

One of the cornerstones of a quality MTSS framework is data analysis for continuous improvement (McIntosh & Goodman, 2015). Given the importance of using data in a timely way for continuous improvement, the success or lack thereof lies with using reliable and valid assessments to the extent possible for each of the assessment purposes outlined in Table 2. Other types of data are also important to collect and use for decision-making. Fidelity data for implementing an MTSS framework (e.g., R-TFI), evidence-based practices, or assessments have an important role in the data analysis process, as do capacity assessment data (e.g., District Capacity Assessment) (Dragoset et al., 2017; Ward et al., 2021). The different types of data and the important role data have in MTSS implementation necessitates districts and schools to compile and document assessment-related information in an assessment system. An assessment system is a way for districts to organize assessments that are used across the schools within the district to ensure accurate and timely information is available and effectively used for decision-making.



The benefits of an assessment system are:

- Helping to develop common language and understanding (e.g., purpose of assessment measures, roles, responsibilities)
- Increasing the confidence that the data are efficiently collected, accurate, and comply with guidelines for student confidentiality
- Ensuring data are accessible when needed for data-based decision-making at multiple levels: school level, grade level, individual student level, and district level
- Building sufficient assessment capacity to increase the sustainability of efforts

*An assessment system is a way for districts to organize assessments that are used across schools to ensure that accurate and timely information is available and used for decision-making.*

An assessment system should be formalized as a living document and updated on an annual basis. Some examples of information to include are the district's annual schedule to administer, score, enter, and analyze assessments; and the individuals selected to coordinate the data collection process and oversee the data management system (e.g., rostering, importing demographic data). Documenting this information can also help educators and leaders understand the level of importance placed on accurate and timely data collection to inform decision-making and continuous improvement.

### **Data Analysis for Continuous Improvement**

One of the goals of data analysis within an MTSS framework is to accelerate literacy outcomes to meet the needs of all learners, including those with characteristics of dyslexia or word-level reading disabilities. Data analysis occurs amongst various teaming structures at the district and school levels—district team (e.g., District Implementation Team), school leadership team, grade-level teams, and a multidisciplinary team—and should inform action. Schools/districts implementing MTSS may be accustomed to

having an implementation plan that is developed based on data, which includes monitoring and revising specific goals and activities as data indicates the need. When teams are analyzing data as they implement their plan, they can consider the following guiding questions:

- Are we implementing our plan? Is our plan working as intended?
- What was our previous need? What is our current need?
- What are the contributing factors? What is our challenge?
- What is our new target? What will we do to achieve that target? Who needs to know?

Each team uses specific types of data to assess needs and identify accomplishments and opportunities for improvement to document in their implementation plan. Below are some questions that can be used by the teams as they analyze reading-specific data.

### **School Leadership Team Data Analysis Questions**

- Compared to our school-wide goal, what percent of learners have reading scores that demonstrate they are on track for future reading success, and is this percent increasing over time? (screening and summative data)
- How are learner reading scores the same or different across groups (i.e., ethnicity, gender, ability, grade level)? (screening and summative data)
- What do learners have to say about their reading skills, progress, and how they are being supported in reading? (experiential data)
- What do parents, families, and caregivers have to say about their children's reading skills, progress, and how their children are being supported in reading? (experiential data)
- How are learner and family perceptions the same or different across groups (i.e., ethnicity, gender, ability, student grade level)? (experiential data)
- Compared to our goals, what percent of teachers are implementing the essential

components of the Tier 1 reading curriculum resources with fidelity? (implementation fidelity data)

- Compared to our goals, what is our level of implementation of the Tier 1 components of an MTSS Framework (Reading Tiered Fidelity Inventory)? (system fidelity data)

### ***Grade-Level Team Data Analysis Questions***

- Compared to our grade-level goal, what percent of learners have reading scores that demonstrate they are on track for future reading success, and is this percent increasing over time? (screening and summative data)
- What percent of learners across the grade level are adequately responding to intervention instruction? (progress monitoring data)
- How are learner reading scores and progress the same or different across groups (i.e., ethnicity, gender, ability) within the grade level? (screening, progress monitoring, and summative data)
- What do learners in our grade have to say about their reading skills, progress, and how they are being supported in reading? (experiential data)
- What do our grade-level parents, families, and caregivers have to say about their children's reading skills, progress, and how their children are being supported in reading? (experiential data)
- How are our grade-level learner and family perceptions the same or different across groups (i.e., ethnicity, gender, ability)? (experiential data)
- Compared to our grade-level goal, are we implementing the essential components of the Tier 1 reading curriculum resources with fidelity? (implementation fidelity)

### ***Multidisciplinary Team Data Analysis Questions***

- What percent of learners with a verified need to access intervention supports can do so within the district's recommended timeline (e.g., within one week)? (experiential data—observation, product review)
- Are there similarities or differences in learners being able to access intervention supports across groups (i.e., ethnicity, gender, ability, grade level)? (experiential data—observation, product review)
- What percent of learners are adequately responding to intervention instruction? (progress monitoring data)
- Is student progress the same or different across groups of learners (i.e., ethnicity, gender, ability, grade level)? (progress monitoring data)
- What do learners receiving intervention supports say about their level of involvement in setting goals, understanding their progress, and how they are being supported in reading? (experiential data)
- What do our parents, families, and caregivers have to say about their level of input and involvement in setting goals, reviewing progress, and designing a reading intervention plan for their children? (experiential data)

## ACTION STEPS

- Discuss commonalities between the essential components outlined in the MDE MTSS Practice Profile, dyslexia legislative efforts, and the contents of this handbook.
- Determine the extent to which MTSS is viewed as an integrated framework to address literacy and social-emotional/behavioral outcomes.
- Ask principals to work with school leadership teams to administer the Reading-Tiered Fidelity Inventory (R-TFI) to determine assets and opportunities for enhancing the reading components of an MTSS framework.
- Conduct a Tier 1 (class-wide) reading curriculum, instructional strategy, and assessment inventory to determine alignment with reading science and ascertain if phonics and word recognition are taught using a code-emphasis approach.
- Assess educator readiness to adopt practices and to use curriculum resources that align with reading science.
- Use reading instructional practices/methods that are empirically proven.

## MORE INFORMATION

### MTSS

- [MDE MTSS Practice Profile](#)
- [MiMTSS TA Center Catalog](#) (MiMTSS TA Center)
- [Intensifying Intervention Instruction to Accelerate Reading Outcomes](#) (MiMTSS TA Center, MDE)
- [Effectiveness of Early Literacy Instruction: Summary of 20 Years of Research: Study Snapshot](#) (REL-SE)
- [10 Key Policies and Practices for Reading Intervention](#) (Meadows Center)
- [Considerations for Scheduling Early Literacy Interventions](#) (REL-SE)
- [Elementary and Secondary Class-wide \(Tier 1\) Reading Instruction](#)
- [Secondary Class-wide \(Tier 1\) Reading Instruction](#)
- [Visual Diagram: Adolescent Literacy](#) (Doing What Works)

### Screening

- [Understanding Screening: Classification Accuracy](#) (NCIL)
- [Best Practices in Universal Screening](#) (NCIL)
- [Considerations in Universal Screening](#) (NCIL)
- [Academic Screening Tools Chart](#) (NCIL)

### MTSS Systems Fidelity

- [Reading-Tiered Fidelity Inventory \(R-TFI\): Reading MTSS fidelity measure](#) (MiMTSS TA Center)

### Assessment System

- [Assessment System Overview](#) (MiMTSS YouTube Channel)
- [Early Literacy Assessment Systems that Support Learning](#) (MAC)
- [MDE's Comprehensive and Balanced Student Assessment System](#)



## Chapter 6: Professional Learning and Implementation Supports: What Districts Can Do

Educators and leaders, including classroom teachers, special education teachers, coaches, and interventionists, should receive ongoing professional learning to be prepared to accelerate literacy outcomes for all learners, including learners with characteristics of dyslexia or word-level reading disabilities.

Many educators have not had the opportunity to learn evidence-based practices and assessment methods that are encapsulated in the science of reading in their pre-service education (EdWeek Research Center, 2020; Moats, 2020; NCTQ, 2018). This is also true for educational leaders, whose administrative preparation program coursework often focuses on leadership theories, school law, finance, and school-community relations. Despite the emphasis in administrative preparation programs on instructional leadership, very little attention is typically paid to discerning between scientifically valid and invalid instructional methods or developing teacher readiness to shift teaching philosophy towards reading science.

Districts can foster a culture of learning and continuous improvement for all by promoting individualized and differentiated professional learning opportunities for staff that are specific to their roles and scope of work. For reading, the Michigan Third Grade Reading Law states that schools will: a) target specific areas of professional development for K-3 teachers based on the reading development needs of learners; b) differentiate and intensify professional development for K-3 teachers based on data gathered by monitoring teacher progress in improving student proficiency rates; and c) ensure that time is provided for K-3 teachers to meet for professional development (Michigan Public Act 306, pp. 2-3). To effectively identify and support learners with characteristics of dyslexia, professional development needs to expand beyond K-3 teachers within the early elementary

grades to include pre-kindergarten teachers, upper elementary grade teachers, K-12 special educators, K-12 staff delivering intervention instruction, K-12 ancillary staff (e.g., school psychologists, speech and language pathologists, teacher consultants), K-12 literacy coaches, and administrators. Professional learning in the following areas should be prioritized:

- Dyslexia characteristics
- Primary and secondary consequences of dyslexia
- Structured language and literacy instructional methods
- Assessment administration, scoring, and data interpretation
- Multi-Tiered System of Supports (MTSS) framework to support literacy and social-emotional behavioral success
- Safe, predictable, and engaging environments in classroom and non-classroom settings
- Classroom strategies for engaging all learners
- Features of quality decoding and word recognition interventions
- Methods to adapt and intensify instruction

When considering time for professional development, research suggests that professional development with more than 14 hours of total learning time can show a positive and significant effect on student achievement (Yoon, Duncan, Lee, Scarloss, & Shapley, 2007).

Furthermore, according to Sections 380.1526 and 1527 of Michigan's Revised School Code, District-Provided Professional Development (DPPD) should: a) serve the purpose of increasing student learning; b) align to the School Improvement Plan; c) be planned, ongoing, and intensive; and d) be supported in some way by the school or district (Michigan Department of Education, 2021, p.1). Professional learning formats to develop knowledge in topics above include professional learning communities/study groups, online learning experiences, or conferences and workshops. The professional learning should be designed with the principles

of adult learning in mind and facilitated by an individual who can effectively incorporate both theory/research and opportunities for educators to demonstrate, practice, and receive feedback on new knowledge and skills acquired through the professional learning experience (Joyce & Showers, 2002). When professional learning included both of these components, participants' knowledge and skill attainment reached 60% (Joyce & Showers, 2002). However, only 5% of participants were able to use the knowledge and skill gained through professional learning in their classrooms (Joyce & Showers, 2002). One key takeaway is that traditional professional learning is necessary but insufficient for educators to feel equipped to use new knowledge and skills in school settings; ongoing, collaborative, job-embedded professional learning is also needed. To the point, educators who received intensive, content-focused professional development in reading—comprised of a summer institute, school-year meetings, and coaching—improved their knowledge and some aspects of their practice (NCEE, 2016).

Districts can leverage their literacy coaches and other staff with literacy expertise to further the development of educators' knowledge and skill in effectively identifying and supporting learners with characteristics of dyslexia. Early literacy coaches are available to support and provide initial and ongoing professional development in literacy-related topics to teachers, including modeling effective instructional strategies for teachers, facilitating study groups, working with teachers to ensure that evidence-based reading programs and interventions are implemented with fidelity, training teachers to diagnose and address reading deficiency, and helping to increase instructional density to meet the needs of all learners (Michigan Public Act 306, pp. 1-2). See below for professional learning resources associated with topics discussed here.



## ACTION STEPS

- Identify the individuals who need professional learning in the topics listed in this section.
- Review the amount of time and implementation practice required for various professional learning options to inform decisions.
- Consider ways to support staff in allocating time to engage in learning and apply the learning to their classroom setting.
- Develop a plan for staff to access professional learning, prioritizing elementary educators and leaders, district curriculum leaders, K-12 special educators and interventionists, and specialized instructional support personnel, such as speech and language pathologists and school psychologists.
- Help educators and leaders understand the scope of learning and timelines for accessing learning.

## MORE INFORMATION

- [International Dyslexia Association Independent Teacher Training Programs Accredited by IDA](#)

### Dyslexia

- [AIM Institute for Learning and Research](#)

### Structured Language and Literacy

- [Language Essentials for Teachers of Reading and Spelling \(LETRS\)](#) (Lexia/Voyager)
- [The Reading Teacher's Top Ten Tools](#) (Deb Glaser)

### Instructional Adjustments and Intensifying Intervention Supports

- [Intensive Intervention in Reading Course Content](#) (NCII)
- [National Center for Intensive Intervention's Online Modules](#) (NCII)

### MTSS

- [MiMTSS TA Center Catalog](#) (MiMTSS TA Center offers professional learning in the topics listed)

### Assessment System

- [A Comprehensive K-3 Reading Assessment Plan: Guidance for School Leaders](#) (Center on Instruction)

### Other

- [Professional Learning Communities Facilitator Guide K-3 for the What Works Clearinghouse Practice Guide: Foundational Skills to Support Reading for Understanding in Kindergarten Through 3rd Grade](#) (REL-SE)
- [Professional Learning Communities Facilitator Guide for the What Works Clearinghouse Practice Guide: Teaching Academic Content and Literacy to English Learners in Elementary and Middle School](#) (REL-SW)



## Chapter 7: Eligibility for Special Education Services

---

When a district suspects a learner has a disability, it has a responsibility to fulfill the Child Find obligation under the Individuals with Disabilities Education Act (IDEA) to identify, locate, and evaluate learners with disabilities who have or may need special education and related services. To determine if a learner is eligible for special education and related services, the district must conduct a comprehensive Initial Evaluation. The initial evaluation process might begin with a review of existing evaluation data, including evaluations and information provided by the parents/caregivers of the child; current classroom-based, local, and state assessment reports; and classroom-based observations. Based on its review of the information, and with input from the parents/caregivers, the district decides what additional data are necessary to determine if the learner needs special education services. In the case of a reevaluation, the district determines whether the learner continues to need special education services and whether any additional modifications are needed to the learner's Individualized Education Program (IEP).

If an assessment is needed to ascertain whether the learner has a disability due to dyslexia, and to meet the educational needs of the learner, including those related to the learner's reading difficulties, then the district must conduct the necessary assessments at no cost to the parents/caregivers. In Michigan, eligibility criteria and required members of a multidisciplinary evaluation team are outlined in the Michigan Administrative Rules for Special Education (MARSE). When evaluating a learner for eligibility, all areas of suspected disability must be considered. For a learner with characteristics of dyslexia, the area of eligibility that most likely should be considered is a specific learning disability (SLD). The multidisciplinary

evaluation team should examine multiple data sources to determine whether the learner with characteristics of dyslexia meets the eligibility criteria for SLD under state and federal law and needs specially designed instruction.

According to the MARSE, SLD means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia.

Eligibility for special education also considers the student's need for special education, which is defined by the IDEA (34 CFR § 300.39) as specially designed instruction intended to:

- Address the unique needs of the student with a disability

- Ensure access of the student to the general education curriculum, so that the student can meet the educational standards that apply to all students

For any learner found eligible for special education, the district has an obligation to provide a Free Appropriate Public Education (FAPE), which means special education and related services are provided at public expense, under public supervision and direction, without charge, and in conformity with an IEP that meets the requirements of the IDEA and MARSE. More information about specific learning disabilities, evaluation requirements, and timelines that are found in the MARSE are listed at the end of this section of the handbook.

## ACTION STEPS

- Facilitate discussions between special education administrators and district and school leaders to answer previous or anticipated questions about special education eligibility and dyslexia.
- Support educators and leaders in understanding students with disabilities are supported within an MTSS framework.
- Use opportunities to distinguish between a Multidisciplinary Evaluation Team and a Multidisciplinary Team that functions as a Child Study or Student Support Team.

## MORE INFORMATION

- [Child Find: Fact Sheet](#) [PDF]
- [Initial Evaluation for Special Education: Fact Sheet](#) [PDF]
- [Michigan Criteria for Determining the Existence of a Specific Learning Disability](#) [PDF]
- [Guidance for Timeline for Initial Evaluations](#) [PDF] and [Special Education Reevaluation Process](#) [PDF]
- [Michigan Administrative Rules for Special Education \(MARSE\) with Related IDEA Federal Regulations](#) [PDF]



## References

- Aaron, P. G. (1989). Qualitative and quantitative differences among dyslexic, normal, and nondyslexic poor readers. *Reading and Writing: An Interdisciplinary Journal*, 1, 291-308.
- Adams, M. J. (1998). "The three-cueing system." In F. Lehr and J. Osborn (Eds.), *Literacy for All: Issues in Teaching and Learning*, pp. 73-99. New York: Guilford Press.
- Al Otaiba, S., Connor, C. M., Foorman, B., Schatschneider, C., Greulich, L., & Sidler, J. F. (2009). Identifying and intervening with beginning readers who are at-risk for dyslexia: Advances in individualized classroom instruction. *Perspectives on Language and Literacy*, 35, 13-19.
- Burns, M. K., Haegele, K., & Petersen-Brown, S. (2014). "[Screening for early reading skills: Using data to guide resources and instruction](#)." In R. J. Kettler, T. A. Glover, C. A. Albers, & K. A. Feeney-Kettler (Eds.), *Universal Screening in Educational Settings: Evidence-based Decision Making for Schools*, pp. 171–197. American Psychological Association.
- Capin, P., & Vaughn, S. (2017). Improving reading and social studies learning for secondary students with reading disabilities. *Teaching Exceptional Children*, 49(4), 249-261.
- Cardenas-Hagan, E. (2020). *Literacy Foundations for English Learners: A Comprehensive Guide to Evidence-based Instruction*. Baltimore, MD: Brookes Publishing Co.
- Castles, A., Rastle, K., & Nation, K. (2018). [Ending the reading wars: Reading acquisition from novice to expert](#). *Psychological Science in the Public Interest*, 19(1), 5–51.
- Centanni, T. M., Norton, E. S., Ozernov-Palchik, O., Park, A., Beach, S. D., Halverson, K., Gaab, N., & Gabrieli, J. D. E. (2019). Disrupted left fusiform response to print in beginning kindergartners is associated with subsequent reading. *NeuroImage: Clinical*, 22.
- Cho, E., Capin, P., Roberts, G., Roberts, G. J., & Vaughn, S. (2019). Examining sources and mechanisms of reading comprehension difficulties: Comparing English learners and non-English learners within the simple view of reading. *Journal of Educational Psychology*, 111(6), 982-1000.
- Corkett, J. K., & Parrila, R. (2008). Use of context in the word recognition process by adults with a significant history of reading difficulties. *Annals of Dyslexia*, 58, 139-161.
- Cortiella, C., & Horowitz, S. H. (2014). *The state of learning disabilities: Facts, trends and emerging issues*. New York: National Center for Learning Disabilities.
- Dragoset, L., Thomas, J., Herrmann, M., Deke, J., James-Burdumy, S., Graczewski, C., Boyle, A., Upton, R., Tanenbaum, C., & Giffin, J. (2017). [School improvement grants: Implementation and effectiveness](#). Executive summary. National Center for Education Evaluation and Regional Assistance.
- EdReports. (2021a). [Units of Study](#).
- EdReports. (2021b). [Fountas & Pinnell Classroom](#).
- EdWeek Research Center. (January 2020). [Early reading instruction: Results from a national survey](#).
- Ehri, L. (2020). The science of learning to read words: A case for systematic phonics instruction. *Reading Research Quarterly*, 55(S1), S45-S60.
- Ehri, L. C. (2014) Orthographic mapping in the acquisition of sight word reading, spelling memory, and vocabulary learning. *Scientific Studies of Reading*, 18(1), 5-21.
- Eunice Kennedy Shriver National Institute of Child Health and Human Development, NIH, DHHS. (2000). *Report of the National Reading Panel: Teaching Children to Read: Reports of the Subgroups* (00-4754). Washington, DC: U.S. Government Printing Office.



Fletcher, J. M., Francis, D. J., Foorman, B. R., & Schatschneider, C. (2021). Early detection of dyslexia risk: Development of brief, teacher-administered screens. *Learning Disability Quarterly*, 44(3), 145–157.

Foorman, B., Beyler, N., Borradaile, K., Coyne, M., Denton, C. A., Dimino, J., Furgeson, J., Hayes, L., Henke, J., Justice, L., Keating, B., Lewis, W., Sattar, S., Streke, A., Wagner, R., & Wissel, S. (2016). *Foundational skills to support reading for understanding in kindergarten through 3rd grade* (NCEE 2016-4008). Washington, DC: National Center for Education Evaluation and Regional Assistance (NCEE), Institute of Education Sciences, U.S. Department of Education. Retrieved from the [NCEE website](#).

Ford, J. W., Kern, A. M., Hosp, M. K., Missall, K. N., & Hosp, J. L. (2018). [Improving efficiency for making screening decisions: A statewide comparison of early literacy curriculum-based measurement tools](#). *Learning Disabilities Research & Practice*, 33(4), 207–218.

Francis, D. J., Kulesz, P. A., & Benoit, J. S. (2018). Extending the simple view of reading to account for variation within readers and across texts: The complete view of reading (CVR i). *Remedial and Special Education*, 39(5), 274–288.

Gaab, N. (n.d.). [Dyslexia myths](#). Gaab Lab.

Gaab, N., Yu, X., & Ozernov-Palchik, O. (2018). “Early atypical brain development in developmental dyslexia”. In A. Galaburda, N. Gaab, & F. Hoeft (Eds.). *Dyslexia and Neuroscience: The Geschwind-Galaburda Hypothesis, 30 Years Later*. Baltimore, MD: Brookes Publishing Co.

Gersten, R., Compton, D., Connor, C. M., Dimino, J., Santoro, L., Linan-Thompson, S., and Tilly, W. D. (2008). [Assisting students struggling with reading: Response to Intervention and multi-tier intervention for reading in the primary grades. A practice guide](#). (NCEE 2009-4045). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.

Goldenberg, C. (2020). [Reading wars, reading science, and English learners](#). *Reading Research Quarterly*, 55(S1).

Goldman, S. R., Snow, C., & Vaughn, S. (2016). Common themes in teaching reading for understanding: Lessons from three projects. *Journal of Adolescent & Adult Literacy*. Advance online publication.

Herrera, S., Truckenmiller, A. J., and Foorman, B. R. (2016). [Summary of 20 years of research on the effectiveness of adolescent literacy programs and practices](#) (REL 2016–178). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southeast.

Hirschmann, M., Farris, E.A., Alexander, E., Flipse, J., & Odegard, T. (2021). [Screening for risk and characteristics of dyslexia](#).

Hughes, C. A., Morris, J. R., Therrien, W. J., & Benson, S. K. (2017). Explicit instruction: Historical and contemporary contexts. *Learning Disabilities Research & Practice*, 32(3), 140–148.

Hurford, D. P., Hurford, J. D., Head, K. L., Keiper, M. M., Nitcher, S. P., & Renner, L. P. (2016). The dyslexia dilemma: A history of ignorance, complacency and resistance in colleges of education. *Journal of Childhood & Developmental Disorders*, 2(3).

Joyce, B. R., & Showers, B. (1981). Transfer of training: The contribution of “coaching”. *Journal of Education*, 163(2), 163-172.

Joyner, R. E., & Wagner, R. K. (2020). Co-occurrence of reading disabilities and math disabilities: A meta-analysis. *Scientific Studies of Reading*, 24(1), 14-22.

Justice, L. M., Pence, K., Bowles, R. B., & Wiggins, A. (2006). An investigation of four hypotheses concerning the order by which 4-year-old children learn the alphabet letters. *Early Childhood Research Quarterly*, 21(3), 374-389.

Kamil, M. L., Borman, G. D., Dole, J., Kral, C. C., Salinger, T., and Torgesen, J. (2008). [Improving adolescent literacy: Effective classroom and intervention practices: A practice guide](#) (NCEE #2008-4027). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.

Kim, Y. S., Petscher, Y., Foorman, B. R., & Zhou, C. (2010). The contributions of phonological awareness and letter-name knowledge to letter-sound acquisition—A cross-classified multilevel model approach. *Journal of Educational Psychology*, 102(2), 313-326.

Kassuba, T., Kastner, S., Torre, G. A., & Raschle, N. M. (2015, April 14). [The reading brain](#). Frontiers for Young Minds.

Kearns, D. M., Hancock, R., Hoeft, F., Pugh, K. R., & Frost, S. J. (2019). The neurobiology of dyslexia. *Teaching Exceptional Children*, 51(3), 175-188.

Kieffer, M. J., Lesaux, N. K., Rivera, M., & Francis, D. J. (2009). [Accommodations for English language learners taking large-scale assessments: A meta-analysis on effectiveness and validity](#). *Review of Educational Research*, 79(3), 1168–1201.

Kilpatrick, D. A. (2015). *Essentials of Assessing, Preventing, and Overcoming Reading Difficulties*. Hoboken, NJ: John Wiley & Sons.

Krafnick, A. J., Flowers, D. L., Napoliello, E. M., Eden, G. F. (2011). Gray matter volume changes following reading intervention in dyslexic children. *Neuroimage*, 57(3): 733-41.

Landerl, K., Fussenegger, B., Moll, K., & Willburger, E. (2009). Dyslexia and dyscalculia: Two learning disorders with different cognitive profiles. *Journal of Experimental Child Psychology*, 103(3), 309-324.

Landerl, K., & Moll, K. (2010). Comorbidity of learning disorders: Prevalence and familial transmission. *Journal of Child Psychology and Psychiatry*, 51(3), 287-294.

Mancilla-Martinez, J., & Lesaux, N. K. (2011). The gap between Spanish speakers' word reading and word knowledge: A longitudinal study. *Child Development*, 82(5), 1544-1560.

McCulley, L. V., & Osman, D. J. (2015). Effects of reading instruction on learning outcomes in social studies: A synthesis of quantitative research. *Journal of Social Studies Research*. Advance online publication.

McIntosh, K., & Goodman, S. (2016). *Integrated Multi-tiered Systems of Support: Blending RTI and PBIS*. New York: Guilford Press.

McIntosh, K., Horner, R. H., Chard, D. J., Dickey, C. R., & Braun D. H. (2008). Reading skills and function of problem behavior in typical school settings. *Journal of Special Education*, 42, 131-147.

Michigan Department of Education. (2021). [Guidelines for Professional Development that Qualifies for Michigan Legislative Requirements under Michigan Compiled Law Sections 380.1526 and 1527](#).

Miciak, J., & Fletcher, J. M. (2020). The critical role of instructional response for identifying dyslexia and other learning disabilities. *Journal of Learning Disabilities*, 53(5), 343–353.

Mishra, R., & Shah, M. A. (2016). [Developing effective English language teaching strategies for non-native English speaking dyslexic students](#). *International Journal of Indian Psychology*, 3(4).

Moats, L. (2020). [Teaching reading is rocket science](#), 2020. What expert teachers of reading should know and be able to do. American Federation of Teachers.

Moats, L. C., & Tolman, C., A. (2019). *LETRS 3rd Edition*. Dallas, TX: Voyager Sopris Learning.

- Moll, K., Snowling, M. J., & Hulme, C. (2020). Introduction to the special issue [“Comorbidities between reading disorders and other developmental disorders.”](#) *Scientific Studies of Reading*, 24(1), 1–6.
- Nation, K., & Snowling, M. J. (1998). Individual differences in contextual facilitation: Evidence from dyslexia and poor reading comprehension. *Child Development*, 69(4), 996-1011.
- National Center for Education Evaluation and Regional Assistance (2016, November). [Does content-focused teacher professional development work?](#)
- Navas, A. L., Ferraz, É., & Amorina, J. (2014). Phonological processing deficits as a universal model for dyslexia: Evidence from different orthographies. *CoDAS*, 26, 509-19.
- NCTQ (August 2018). [NCTQ Databurst: Strengthening reading instruction through better preparation of elementary and special education teachers.](#)
- Olulade, O. A., Napolielo, E. M., & Eden, G. F. (2013). Abnormal visual motion processing is not a cause of dyslexia. *Neuron*, 79(1), 180-190.
- Pennington, B. F. (2006). From single to multiple deficit models of developmental disorders. *Cognition*, 101(2), 385-413.
- Petscher, Y., Cabell, S., Catts, H. W., Compton, D., Foorman, B., Hart, S. A., et al. (2020). How the science of reading informs 21st century education. *Reading Research Quarterly*, 55(S1), S267-S282.
- Petscher, Y., Fien, H., Stanley, C., Gearin, B., Gaab, N., Fletcher, J. M., & Johnson, E. (2019). *Screening for Dyslexia*. Washington, DC: U.S. Department of Education, Office of Elementary and Secondary Education, Office of Special Education Programs, National Center on Improving Literacy. Retrieved from [improvingliteracy.org](#).
- Regional Educational Laboratory-Southeast. (2019, June). [Evidence-based teaching practices](#) [infographic].
- Raschle, N. M., Becker, B., Smith, S., Fehlbauer, L. V., Wang, Y., & Gaab, N. (2017). Investigating the influences of language delay and/or familial risk for dyslexia on brain structure in 5-year-olds. *Cereb Cortex*, 27(1): 764-776.
- Scarborough, H. S. (2001). “Connecting early language and literacy to later reading (dis)abilities: Evidence, theory, and practice.” In S. Neuman & D. Dickinson (Eds.), *Handbook for Research in Early Literacy* (pp. 97–110). New York: Guilford Press.
- [Science of Reading: A Defining Moment.](#) (n.d.). Printable guide.
- Seidenberg, M. S. (2017). *Language at the Speed of Sight: How We Read, Why So Many Can't, and What Can Be Done about It*. New York: Basic Books.
- Shaywitz, S. E. (1998). Dyslexia. *New England Journal of Medicine*, 338(5), 307-312.
- Snowling, M., Hayiou-Thomas, M., Nash, H., & Hulme, C. (2019). Dyslexia and developmental language disorder: Comorbid disorders with distinct effects on reading comprehension. *Journal of Child Psychology and Psychiatry*, 61.
- St. Martin, K., Vaughn, S., Troia, G., Fien, & H., Coyne, M. (2020). *Intensifying literacy instruction: Essential practices*. Lansing, MI: MiMTSS Technical Assistance Center, Michigan Department of Education.
- Stevens, E. A., Murray, C. A., Fishstrom, S., & Vaughn, S. (2020). [Using question generation to improve reading comprehension for middle grade students.](#) *Journal of Adolescent and Adult Literacy*. Advance online publication.

Student Achievement Partners. (January 2020). [Comparing reading research to program design: An examination of Teachers College Units of Study](#).

Swanson, H. L., & Deshler, D. (2003). Instructing adolescents with learning disabilities: Converting a meta-analysis to practice. *Journal of Learning Disabilities*, 36(2), 124–135.

Vaughn, S., Mathes, P., Linan-Thompson, S., Cirino, P., Carlson, C., Pollard-Durodola, S., et al. (2006). [Effectiveness of an English intervention for first-grade English language learners at risk for reading problems](#). *Elementary School Journal*, 107(2), 153–180.

Wang, Y., Mauer, M., Raney, T., Peysakhovich, B., Becker, B., Sliva, D., & Gaab, N. (2017). Development of tract-specific white matter pathways during early reading development in at-risk children and typical controls. *Cereb Cortex*, 27(4), 2469-2485.

Ward, C. S., Harms, A. L., St. Martin, K., Cusumano, D., Russell, C., & Horner, R. H. (2021). [Development and technical adequacy of the District Capacity Assessment](#). *Journal of Positive Behavior Interventions*. Advance online publication.

What Works Clearinghouse (WWC) (2007). [Early childhood education intervention report: Dialogic reading](#). Washington, DC: US Department of Education, Institute of Education Sciences.

Williams, K. J., & Martinez, L. R. (2019). [Supporting reading comprehension for students who are learning English and have learning disabilities](#). *Intervention in School and Clinic*, 55(1), 23–31.

Yoon, K. S., Duncan, T., Lee, S. W.-Y., Scarloss, B., & Shapley, K. (2007). [Reviewing the evidence on how teacher professional development affects student achievement](#) (Issues & Answers Report, REL 2007–No. 033). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory-Southwest.

### **This document should be cited as follows:**

St. Martin, K., Seyko, S., Rotarius, N., Proebstle, S., Brehmer, J., Edwards, C., Rink, T. (2022). *Michigan Dyslexia Handbook: A Guide to Accelerating Learner Outcomes in Literacy*. (Version 1.0). Michigan Department of Education.









The Michigan Department of Education complies with all Federal laws and regulations prohibiting discrimination, and with all requirements of the U.S. Department of Education and U.S. Department of Agriculture.

The Michigan Department of Education does not discriminate on the basis of race, color, national origin, sex, disability, or age in its programs and activities and provides equal access to the Boy Scouts and other designated youth groups.