Module 1: Understanding the Science of Reading

Module Description

We begin this module by introducing the science of reading and why understanding the science matters. We'll introduce the various bodies of evidence that inform effective reading instruction. We will also become familiar with how reading develops, spanning from students' earliest alphabetic skills through the continuum of fluent word recognition and the skilled text comprehension characteristics of expert readers. We will consider the relationship between decoding skills and language skills through the Simple View of Reading. We will learn the elements necessary for automatic word recognition through examination of Scarborough's Reading Rope Model. Through the Four-Part Processing Model for word recognition, we will learn how reading is an integrated system that engages four processing systems simultaneously and why reading instruction should target all of the processing systems and enable them to work together. We will also become familiar with how the brain processes language. We will review the five components of reading identified by the National Reading Panel Report, as well as challenges that English Learners (ELs) may face and strategies for their instruction. We will explore factors that contribute to reading difficulties, types of reading disabilities, and the differences in how good readers and struggling readers utilize their brain. We will learn the importance of explicit, systematic instruction and the elements of effective instruction that build upon previously taught skills in a logical sequence. We will have an introduction to assessments for planning instruction including the differences between screening, diagnostic, outcome, and progress monitoring assessments. Finally, you will explore the principal's role in leading the science of reading. Leaders will examine the necessary school systems that need to be in place to support building a vision that incorporates the science of reading. Through an understanding of the science of reading, leaders will be able to gauge the stage of implementation when they observe in classrooms. This knowledge, combined with student measures included in the school's comprehensive literacy assessments, will inform leaders as they monitor school data and foster successful literacy outcomes for all students.

Module Objectives

In this module, participants will learn the following:

- Understand and explain the language processing requirements of proficient reading and writing including phonological (speech sound) processing, orthographic (print) processing, semantic (meaning) processing, syntactic (sentence-level) processing, and discourse (connected text-level) processing.
- Understand and explain other aspects of cognition and behavior that affect reading and writing, including attention, executive function, memory, processing speed, and graphomotor control.
- Define and identify environmental, cultural, and social factors that contribute to literacy development (e.g., language spoken at home, language and literacy experiences, cultural

values).

- Know and identify phases in the typical developmental progression of oral language (semantic, syntactic, pragmatic), phonological skills, printed word recognition, spelling, reading fluency, reading comprehension, and written expression.
- Understand and explain the known causal relationship among phonological skills, phonic decoding, spelling, accurate and automatic word recognition, text reading fluency, background knowledge, verbal reasoning skill, vocabulary, reading comprehension, and writing.
- Know and explain how the relationships among the major components of research-based literacy development change with reading development (i.e., changes in oral language, including phonological awareness; phonics and word recognition; spelling; reading and writing fluency; vocabulary; reading comprehension skills and strategies; and written expression).
- Know reasonable goals and expectations for learners at various stages of reading and writing development.
- Leaders will understand and establish a vision for the implementation of the science of reading that includes unpacking any bias about reading instruction.
- Leaders will develop knowledge of implementation science and reflect on their school or district's current stage of implementation of the science of reading.
- School leaders will review current school-wide systems for the implementation of the science of reading that includes shared leadership, data-driven decision-making, comprehensive screening and assessment, layered continuum of supports, and professional learning, coaching, and feedback systems.
- Leaders will understand the key consideration needed when adopting instructional resource materials aligned with the science of reading.

Module Outline

Section 1: Introduction

Welcome (required)
Welcome to Understanding the Science of Reading. This module is the first of six online modules in the Building a Strong Foundation for Lifelong Literacy Success professional learning series aimed at supporting teachers' efforts to promote reading achievement in kindergarten through twelfth grade.

Here are the modules in this course:

- Module 1: Understanding the Science of Reading
- Module 2: Building Oral Language and Phonology
- Module 3: Exploring Phonics and Word Study
- Module 4: Creating Fluent Readers
- Module 5: Developing Vocabulary
- Module 6: Increasing Reading Comprehension

School leaders are provided with the same professional development that k-12 educators take. Some sections are marked required and some are optional. School leaders must complete the required sections and subsections. The optional sections are available for school leaders as a reference.

Pre-Assessment (required)

Anticipation Guide (required)

Section 2: Scientific Approach to Reading Instruction

Section Overview (optional)
In this section, we will introduce the science of reading and how it supports teachers and students, as well as synthesize the research on how students learn to read and how they can best be taught. We will also provide information on how reading develops, spanning from oral language development and alphabetic skills through to the fluent word recognition and skilled text comprehension characteristics of expert readers. Finally, we will provide a review of the Colorado Academic Foundational Reading Skills Standards.

Information you learn in this section provides foundational knowledge to support the entire module. Understanding how the reading process works is applicable for all educators as it provides a window into the important skills that create efficient readers of myriad texts and content.

What Is the Science of Reading? (optional)
In this subsection, you will write down what you already know about the science of reading and then review a well-vetted definition. You will also review the National Assessment of Educational Progress (NAEP) scores and answer questions regarding those results. Lastly, you will read an article, “What Science Offers Teachers of Reading” and view a video, “How the Science of Reading Improves Outcomes for Teachers.”

What Does Research Say About Reading? (required)
In this subsection, you will read excerpts from two articles, “Toward a Curriculum for Teacher Preparation and In-Service Professional Development” and “Six Reasons to Use the Science of Reading in Schools,” and reflect on why teacher knowledge about reading instruction is so essential.

How Reading Develops (required)
In this subsection, you will learn about the development of foundational literacy skills and reflect on your students' performance of these skills, thinking about what skills may need additional reinforcement.

The Science of Learning to Read (required)
In this subsection, you will consider what reading is and how students learn to read. You will read an

excerpt from the article “Ending the Reading Wars: Reading Acquisition from Novice to Expert,” watch a video, and read its accompanying article, “How do Kids Learn to Read?” in order to understand the nature of learning to read and the need for explicit instruction.

The Colorado Academic Standards for Foundational Reading Skills (required)
This subsection provides a brief presentation of the basic foundational skills embedded in the Colorado Academic Standards and provides an opportunity for you to review these skills by grade level (kindergarten to twelfth).

Check for Understanding (required)

Section 3: Introduction to Reading Research

Section Overview (optional)
This section of the module has six focus areas. Here you will learn about the Simple View of Reading, Scarborough’s Reading Rope model, The Four-Part Processing Model for word recognition, what the brain does when it reads, the five components of reading, and different types of reading difficulties.

This section of the module provides a deeper dive into the conceptual models of reading and delineates the processes of becoming a skilled reader. It is applicable for all educators, as it provides the foundational knowledge to understand the reading process and to identify when there is a breakdown.

The Simple View of Reading (required)
In this subsection, you will take a deep dive into the Simple View of Reading (SVR) through a multimedia presentation and unpack the model by completing the associated handout.

Scarborough’s Reading Rope (required)
In this subsection, you will view a multimedia presentation on Scarborough’s Reading Rope model and its graphic representation, testing your knowledge of each component, and then answer application questions in a teaching scenario.

The Four-Part Processing Model for Word Recognition (required)
The last mental model we will explore is the Four-Part Processing Model for word recognition. This model explains reading as an integrated system that engages four processing systems simultaneously. In this subsection, you will learn about these four systems via a multimedia presentation and participate in an activity that will help you to see this model in action. Then you’ll complete a reflection and test your knowledge of the four processors.

What the Brain Does When It Reads (required)
Brain research is an area of scientific investigation looking for the best ways to teach students how to read. In this subsection, you will learn and identify the parts of the brain that are involved in the reading

process and view a video, “How the Brain Learns to Read,” with Dr. Dehaene, a leading researcher on learning and the brain, completing a note catcher to use for future reference.

The Five Components of Reading (required)
In this subsection, you will review each of the five components, what they are, and the types of instruction needed in each area with adjustments for English Learners. You will have the opportunity to review each component further via the “National Reading Panel Report”. You will watch a video, “Components of Adolescent Literacy Instruction in a MTSS Model”, and read an article “Reading 101 for English Language Learners”, to take note of the research-based strategies to address challenges when teaching English Learners. Finally, you will have the opportunity to read the article, “When Older Students Can’t Read.”

Special Considerations in Literacy Instruction (required)
The content emphasizes that effective literacy instruction for English Learners must address the five core components of reading—phonemic awareness, phonics, vocabulary, fluency, and comprehension—while using targeted, research-based strategies to overcome language-specific challenges. Educators are encouraged to reflect on their current practices and implement at least one new strategy to support English Learners more effectively. Similarly, struggling adolescent readers benefit from revisiting foundational skills such as phoneme awareness and the alphabetic principle, rather than relying on ineffective methods like context clues, in order to close skill gaps and support continued academic progress.

Types of Reading Difficulties (required)
In this subsection, you will explore factors that contribute to reading difficulties. You will also use the Simple View of Reading to learn about two distinct forms of reading difficulties in students: word reading or dyslexia (difficulty in learning to translate print to speech) and reading comprehension difficulties (Hulm & Snowling, 2016). You will read an article, “Structured Literacy and Typical Literacy Practices”, and have the opportunity to read three additional articles related to working memory, executive function, and managing attention problems. You will view a multimedia presentation that includes a video, “Expert Minute with Dr. Tim Odegard,” to explore dyslexia, and access to other resources from the International Dyslexia Association (IDA). You will also explore language comprehension difficulties by listening to Dr. Dorothy Bishop, a seminal researcher in this field. You will explore additional resources for students with developmental language disorders. Finally, you will explore the differences in how different readers utilize their brains and watch a video, “How the Brain Works with Dyslexia” with Dr. Guinevere Eden.

Word Reading Difficulties (required)
This section focused on dyslexia that affects a significant portion of the population, with 15–20% showing symptoms such as slow or inaccurate reading, poor spelling, and difficulty with language, even if not all qualify for special education. Effective intervention requires systematic, explicit instruction—not quick fixes or unsupported strategies—and must be grounded in the science of reading, including

understanding brain-based differences and phonological processing challenges. Teachers must also confront common myths about dyslexia and explore additional developmental reading disabilities and their connection to the Simple View of Reading.

Language Comprehension Difficulties (required)

In this section, the disorder of developmental language delay is addressed through a video and then it circles back to understanding dyslexia and how the brain of a known person with dyslexia functions differently than a neurotypical brain and the implications for instruction.

Check for Understanding (required)

Section 4: Effective Instructional Practices

Section Overview (optional)
This section of the module will focus on the elements of effective instruction, including the importance of explicit, systematic instruction and the elements of effective instruction that build upon previously taught skills in a logical sequence.

Features of Effective Instruction (optional)
In this multimedia presentation, you will explore the five areas of effective instruction, including instruction that is systematic and explicit, provides multiple models, and offers multiple opportunities for students to practice along with explicit correction procedures and scaffolds.

Watch and Learn: Explicit Instruction (optional)
In this activity, you will watch a video of Anita Archer describing explicit instruction and complete an activity to further understand and reinforce the information.

Watch, Read, and Learn: Where Are the Features? (optional)
In this activity, you will view a grade-level video and complete a checklist, looking for the features of effective instruction. You'll also have the opportunity to read an article, "Principles of Effective Instruction: Research Based Strategies That All Teachers Should Know". This subsection is applicable to all educators as it provides specific elements of effective instruction. These elements can be applied to all content areas and across all grade levels.

Check for Understanding (optional)

Section 5: Understanding Reading Assessment

Section Overview (optional)
In this section, Understanding Reading Assessment, we will have an introduction to assessments for

planning instruction, including the differences between screening, diagnostic, outcome, and progress monitoring assessments. This section is intended for all educators and aims to provide an understanding of various types of reading assessments and purpose.

In this section, you will learn to understand the differences among screening, diagnostic, outcome, and progress monitoring assessments.

Why Reading Assessment Is Necessary (optional)
In this subsection, you will explore reading assessment and why early diagnosis and intervention are essential, and read an article "Genetics, the Environment, and Poor Instruction as Contributors to Word-Level Reading Difficulties". You will view three videos featuring Dr. Nadine Gaab, including "Can Science Help Bridge the Classroom Gap?", reflect on what you have learned. and review assessment terminology related to the selection of effective classroom tools.

Preventing Reading Difficulties (optional)
This content emphasizes the importance of shifting from a deficit-based model to a preventative model for reading difficulties, highlighting early screening and intervention as critical tools. Dr. Nadine Gaab explains that effective assessment tools must be reliable, valid, sensitive, and specific to accurately identify students at risk and ensure appropriate support. Models like RTI within MTSS illustrate how schools can implement universal screening, progress monitoring, and targeted instruction to prevent future reading challenges.

Types of Reading Assessments (optional)
In this subsection, you will learn the differences between four types of assessments—screening, diagnostic, outcome, and progress monitoring and how this applies across all grade levels.You will review the different components of assessment types and fill in a chart and reflect on the assessments you currently incorporate into instruction. You will also review how to use diagnostic data to provide intervention to struggling readers.

Planning for Assessment (optional)
In this subsection, you will explore the purpose of assessment planning, the importance of root cause analysis, factors that can affect adolescent assessment, and the typical flow of primary and secondary assessment.

Check for Understanding (optional)

Section 6: Leading the Science of Reading

Section Overview (required)
In this section, you will explore the principal's role in leading the science of reading

Building a Vision for School-Wide Adoption and Implementation of Science of Reading (required)

In this subsection, school leaders will read "The Effective Principal," which describes five pivotal practices of effective leadership. Leaders will be asked to reflect on a series of questions related to the article. Those questions will center around creating a clear and shared focus, building leadership in others, improving instruction, and fostering safe and trusting environments.

Implementation Science (required)
In this subsection, leaders will be introduced to the National Implementation Research Network's (NIRN) implementation science and its importance in gauging stages of implementation to monitor classrooms and inform systemic adoption and sustainability efforts of science of reading practices and procedures.

School Systems Necessary for Implementation of the Science of Reading (required)
In this subsection, we discuss the systems that need to be in place for successfully implementing the science of reading. Leaders will explore the importance of a collective and coherent approach aligned to school-wide systems necessary for the science of reading and literacy.

Selecting a Reading Core, Supplemental and Intervention Materials (required)
In this subsection, we will examine the necessary components of science of reading materials and practice.

Check for Understanding (required)

Section 7: Closing Activities

Section Overview (optional)
Section 6 includes instructions for you to consider what you have learned in this introductory module, Understanding the Science of Reading.

Put It into Practice (optional)
This activity revisits the questions from the introductory Anticipation Guide and asks questions for you to reflect on related to Module 1 content.

Post-Assessment (required)

Module Feedback (required)

Resource Library

Section 8: Closing Activities

Module Completion (required)