

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. Finally, we will have an introduction to assessments for planning instruction including the differences between screening, diagnostic, outcome, and progress monitoring assessments.

*Note for educators who took the K–3 Building a Strong Foundation: Developing Early Literacy Skills training: Content additions are embedded throughout the new K–12 Building a Strong Foundation for Lifelong Literacy Success course, including the addition of examples, videos, and resources. The text in **green font** indicates where significant updates have been made.

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.

Module Outline

Section 1: Introduction

Introduction

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

Pre-Assessment

Anticipation Guide

Section 2: Scientific Approach to Reading Instruction

Section Overview

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?

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?

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

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

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

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

Section 3: Introduction to Reading Research

Section Overview

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

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

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

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

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

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."](#)

Types of Reading Difficulties

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.

Check for Understanding

Section 4: Effective Instructional Practices

Section Overview

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

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

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?

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

Section 5: Understanding Reading Assessment

Section Overview

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

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.

Types of Reading Assessments

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

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

Section 6: Closing Activities

Section Overview

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

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

Module Feedback

Module Completion