Considering Dyslexia: Looking at the Big Picture

CORE LEARNING

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Meet Your Presenter

Tim Odegard, Ph.D.
Professor of Psychology and Chair of Excellence in Dyslexic Studies
Middle Tennessee State University

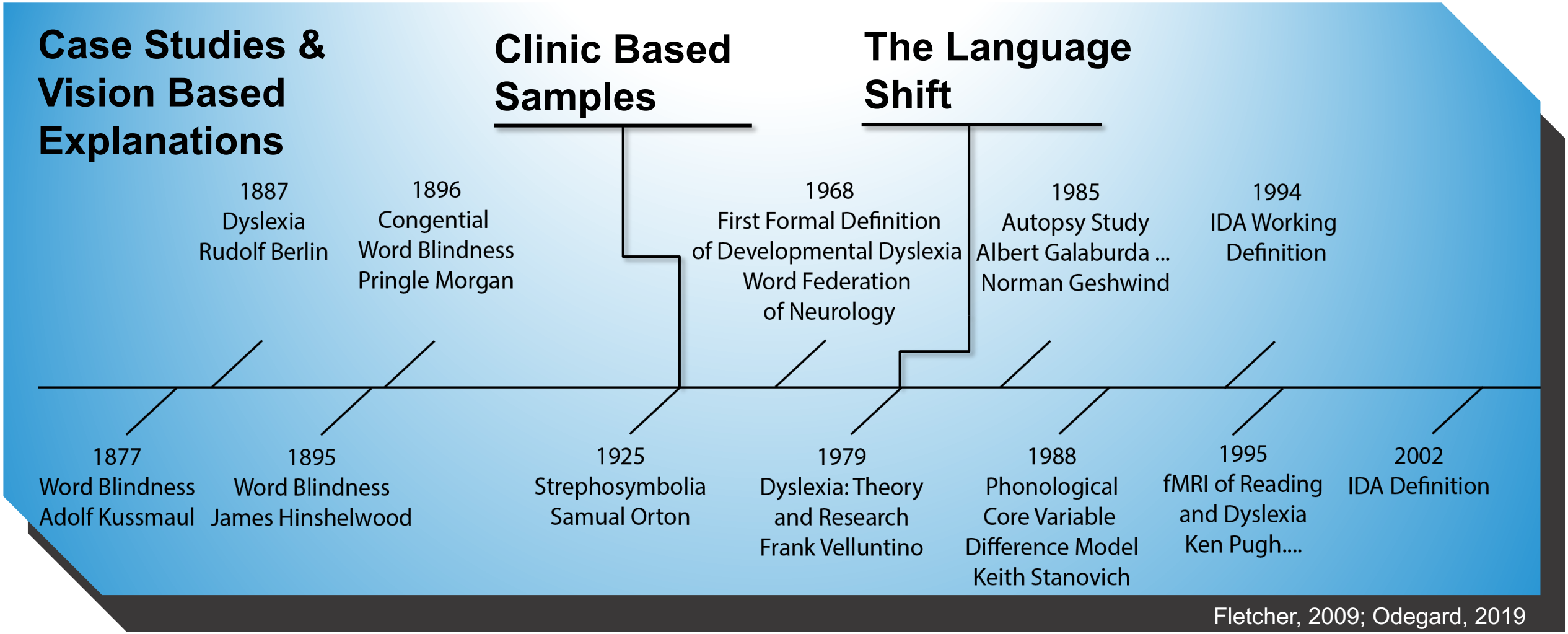
What You Will Learn

- The evolution of dyslexia and its definition over the past 150 years
- Best practices for screening for the risk of dyslexia
- Best practices for screening for the primary characteristics of dyslexia
- The national landscape of policy around screening for dyslexia

Section 1

Evolution of Dyslexia as a Construct and its Definition

Dyslexia: The Evolution of a Construct



Fletcher, 2009; Odegard, 2019

Language Basics

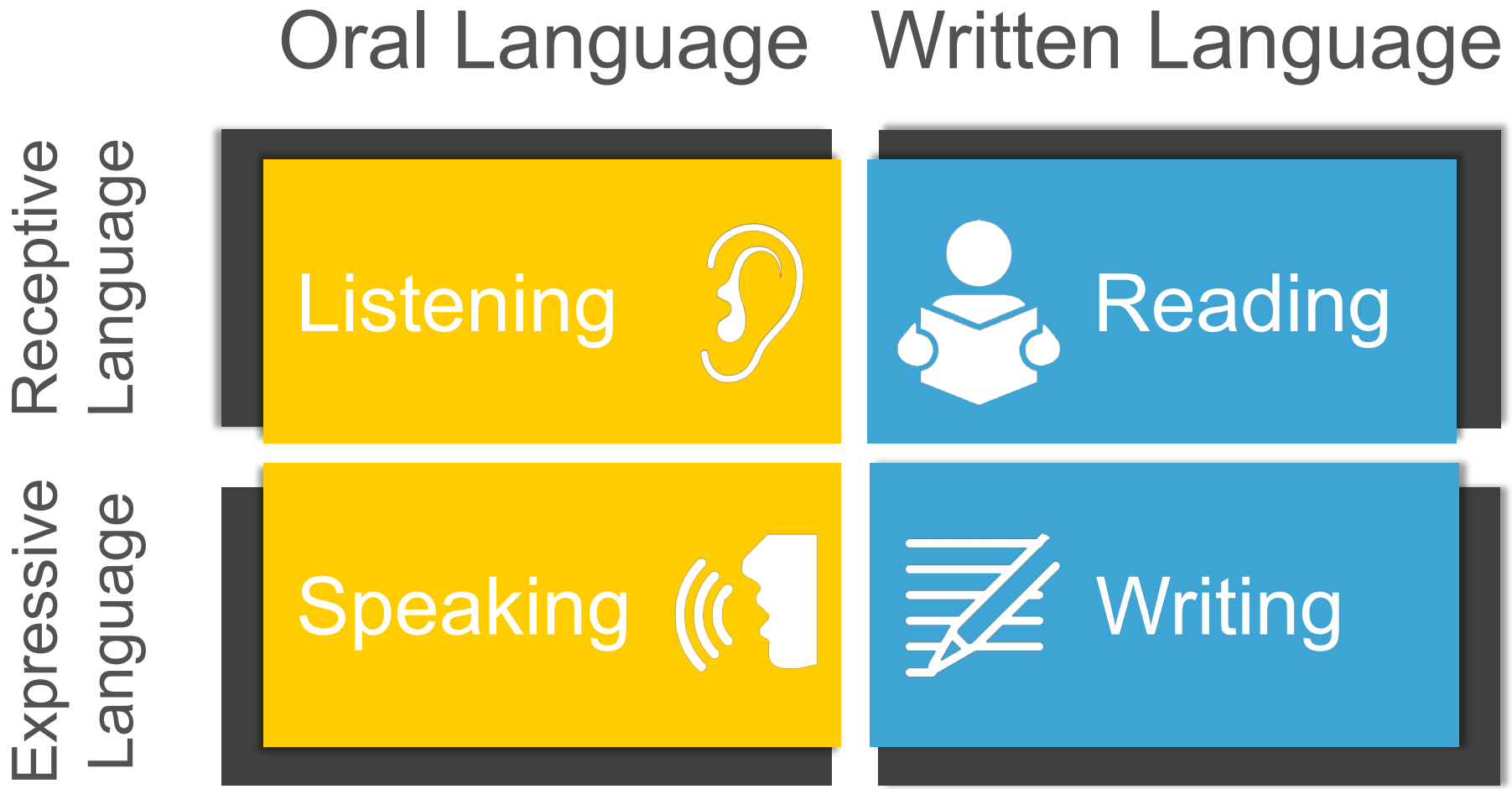


Figure developed based on the American Speech-Language-Hearing Association (ASHA) definition of language.

Oral and Written Language Development

1 Oral Language comes first

As a species, we have been using spoken language to communicate for a very long time.

Highly integrated brain regions forming networks have evolved to allow for oral language.

Reading is the interaction between attention, language, visual processing, and knowledge.

2 Reading Must be Taught

Children unconsciously learn how to understand and produce oral language as the result of being exposed to it from birth.

Children must be directly taught how to read words (and to write). They do not learn how to do so merely by being exposed to written language.

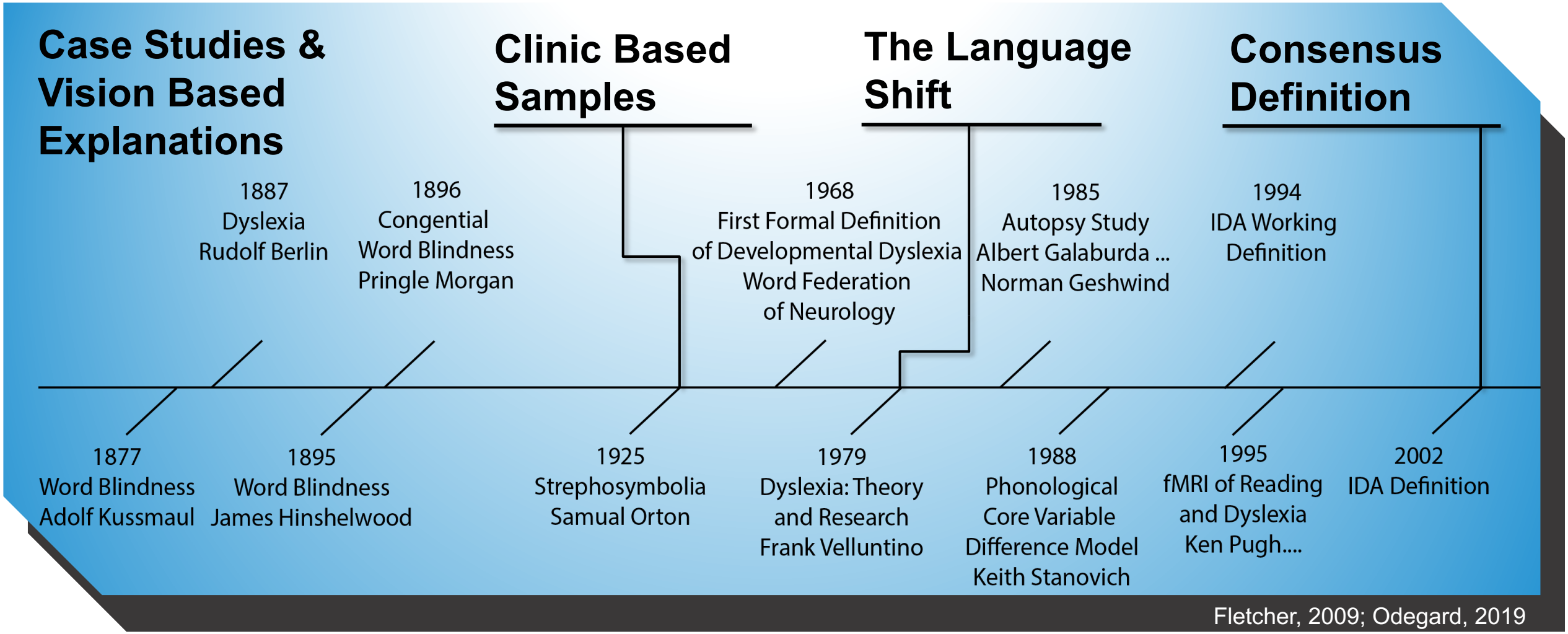
3 Oral Language is ever present

We are immersed in oral language. It is our primary means of interacting with others in the world.

Oral language continues to develop and expand even after a child enters school and this development interacts with reading development.

Dehaene, 2009; Pugh et al., 2010; Wolf, 2007

Dyslexia: The Evolution of a Construct



Fletcher, 2009; Odegard, 2019

Consensus Definition of Dyslexia

Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/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 and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede the growth of vocabulary and background knowledge.

International Dyslexia Association (2002)

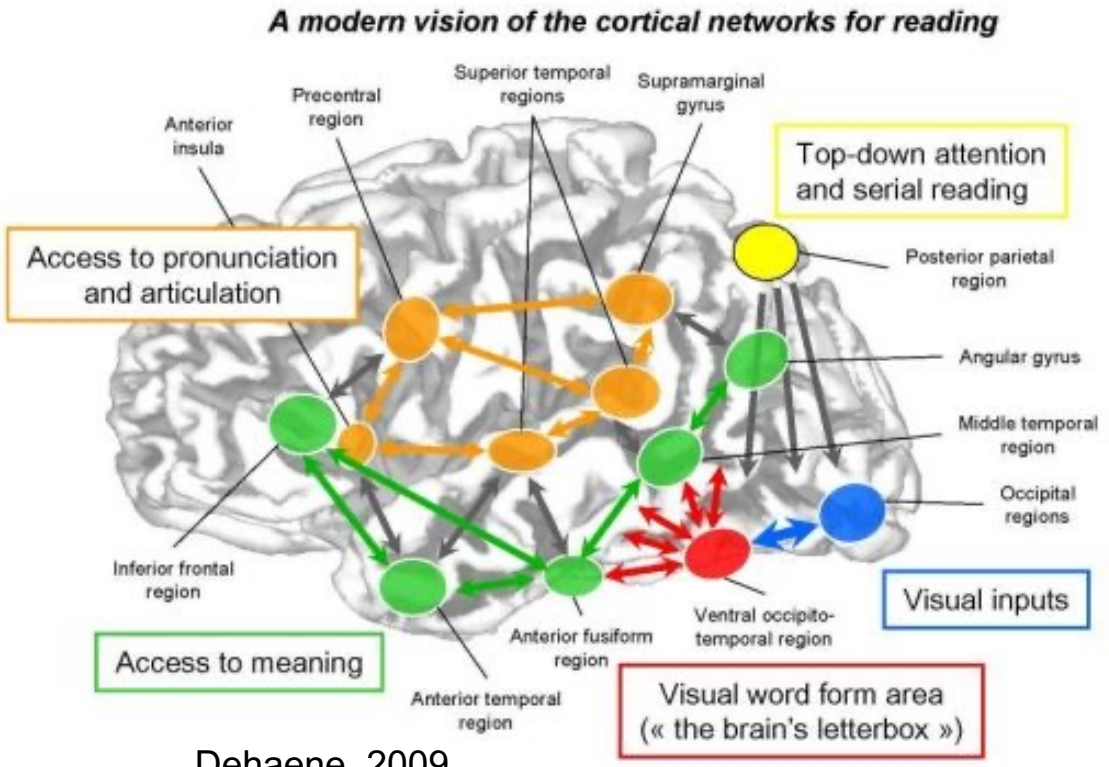
Neurobiological in Origin

Dyslexia is a brain-based type of learning disability that specifically impairs a person's ability to read.

Excerpt from the definition adopted by the National Institute of Child Health and Human Development (2014)

Differences are commonly observed in the brains of individuals with dyslexia when compared to typically developing reading in different indicators of neurobiology

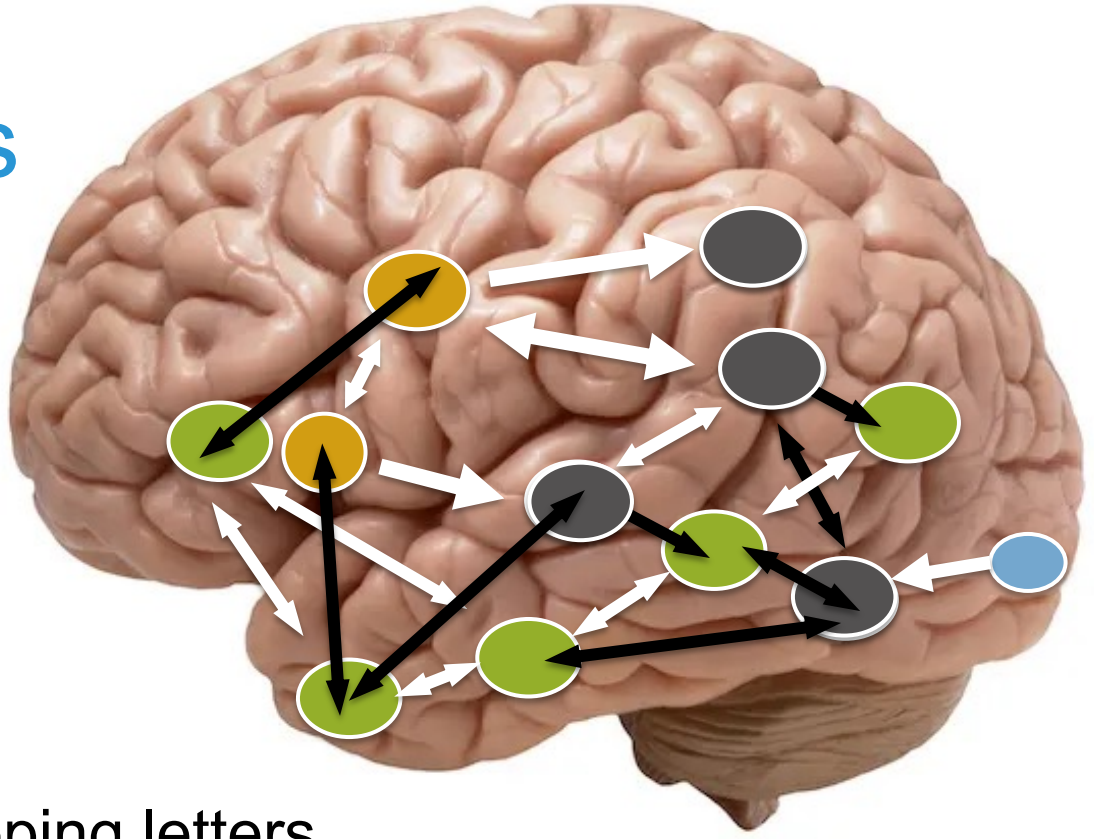
1) Structural Brain Differences
2) Functional Brain Differences
3) Differences in Brain Connectivity
4) Differences in Brain Chemistry



Dehaene, 2009

Structural Brain Differences

Structural brain differences are observed between children and adults with dyslexia when they are compared to their peers who do not struggle to read.



Left hemisphere

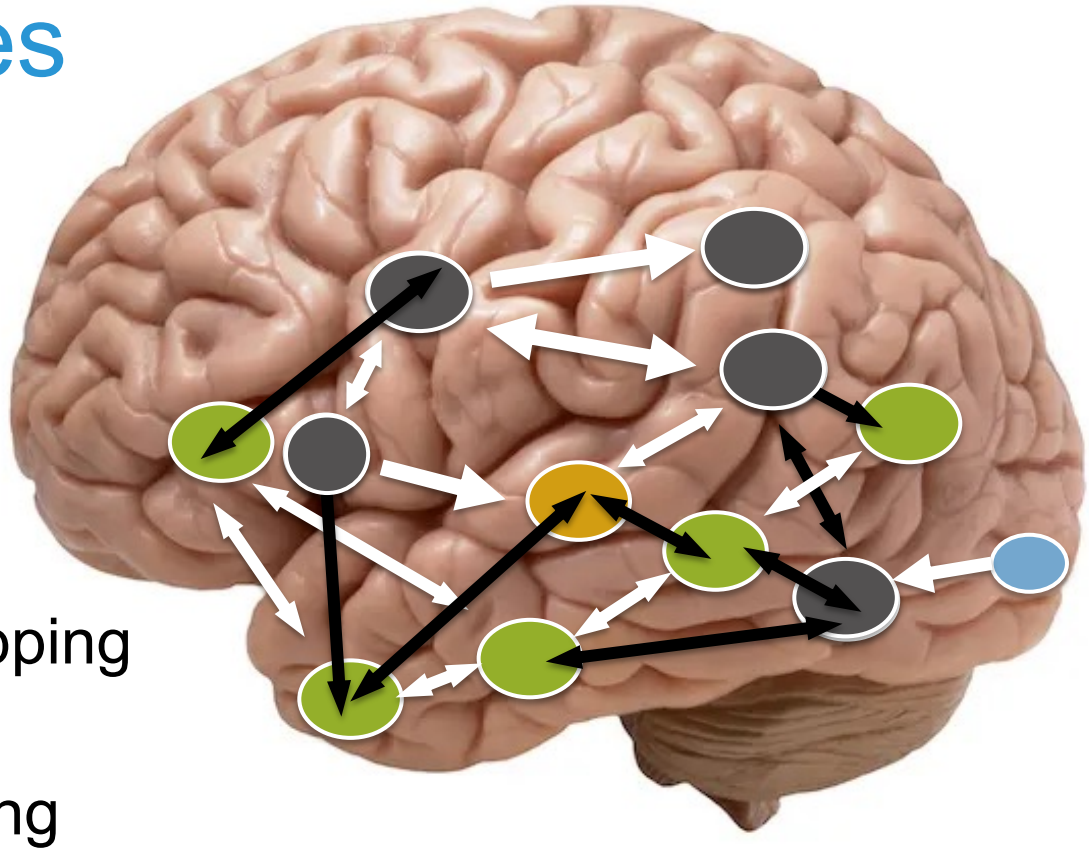
Differences occur in 2 main areas:

1. Areas in the back of the brain involved in mapping letters and sounds together (interfacing the **phonological** and **orthographic modules** of reading)
2. The brain's letterbox responsible for processing letters as visual units (**orthographic module** of reading).

Richlan, F., et al., 2011; Raschle et al., 2011; 2012

Functional Brain Differences

Functional brain differences are observed between children with dyslexia compared to their peers who do not struggle to read.



Left hemisphere

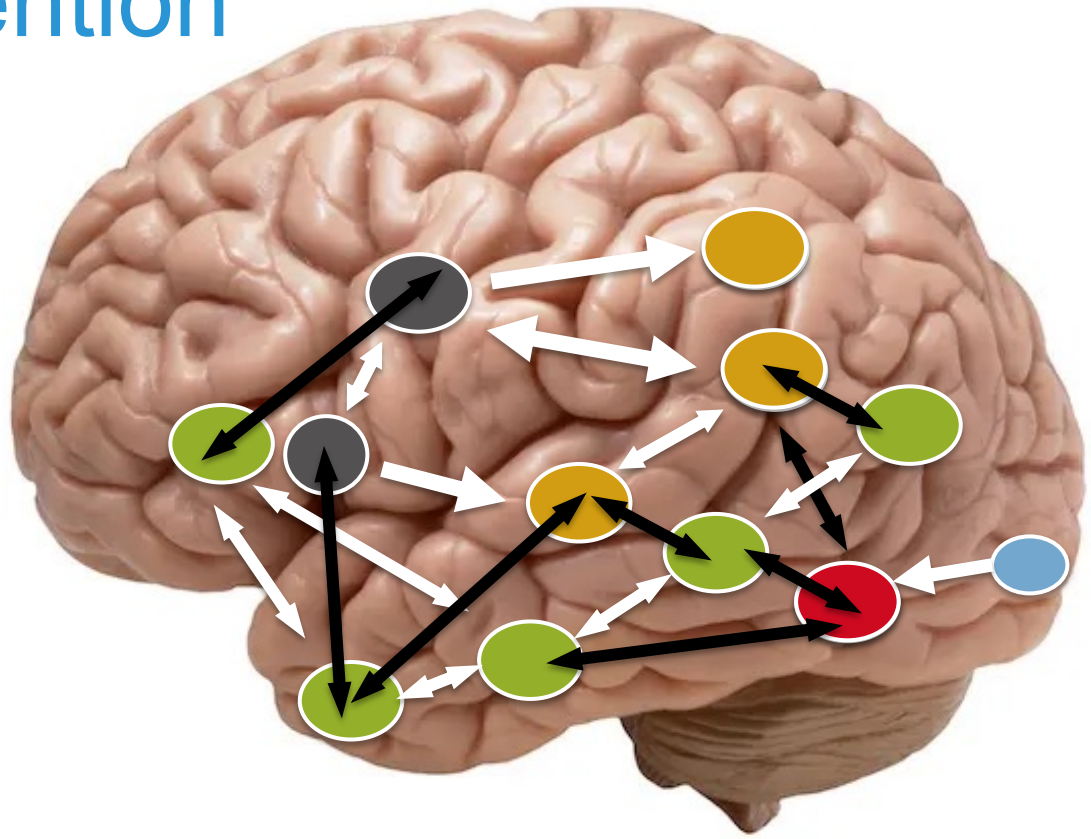
Differences occur in 3 main areas:

1. Areas in the back of the brain involved in mapping letters and sounds together
2. The brain's letterbox responsible for processing letters as visual units.
3. Areas in the front of the brain involved in the articulation of spoken language.

Richlan, F., et al., 2011; Pugh et al., 2010

Functional Normalization Following Intensive Intervention

After receiving an intensive intervention, individuals with dyslexia experience increased brain function in key areas of the brain.



Left hemisphere

A normalization of function in response to intervention is observed in 2 areas:

1. Areas in the back of the brain involved in mapping letters and sounds together
2. The brain's letterbox responsible for processing letters as visual units

Eden et al., 2004; Odegard et al., 2008; Shaywitz et al. 2004; Simos et al., 2007

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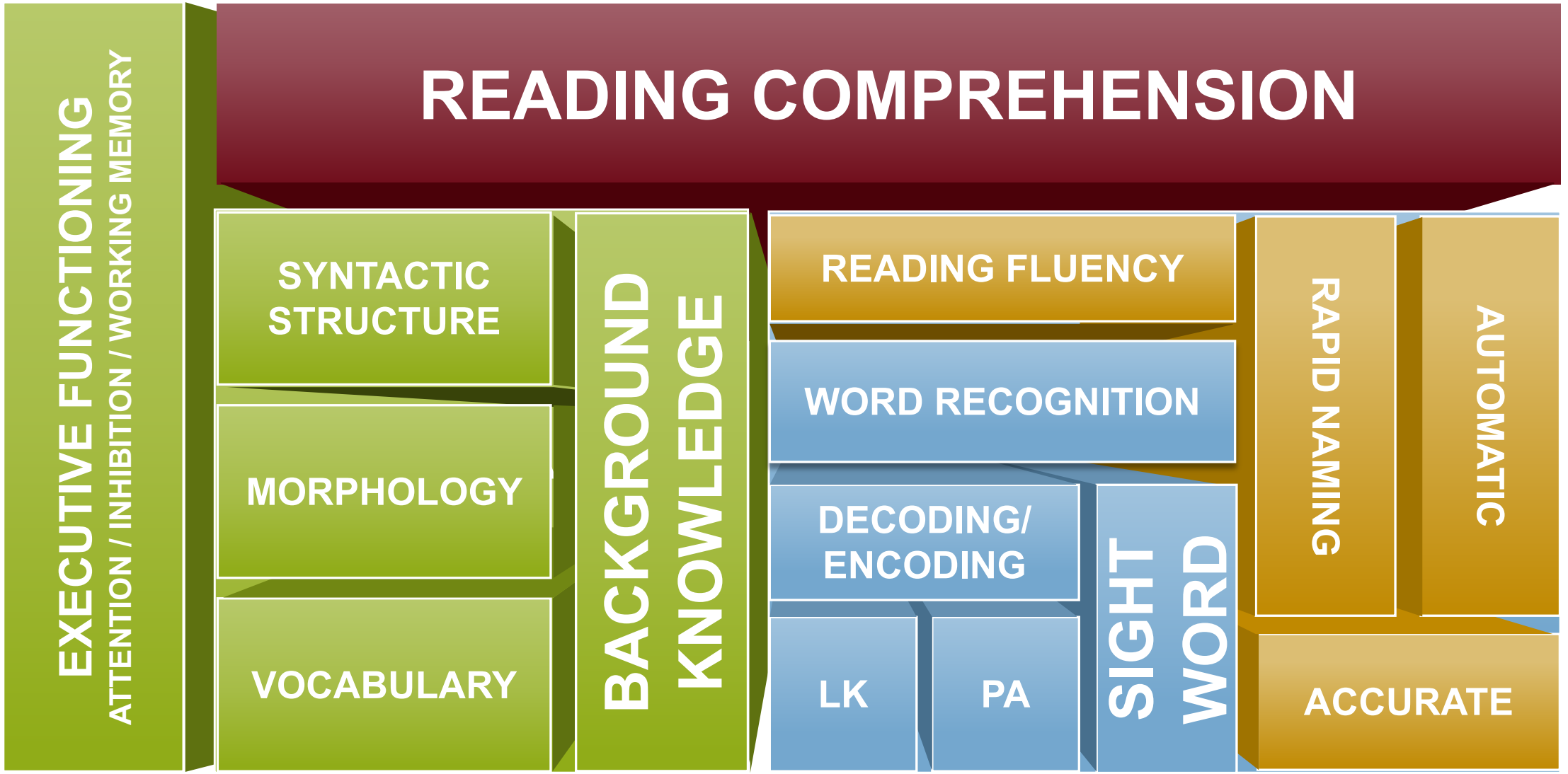
Component View of Reading



Odegard, 2016

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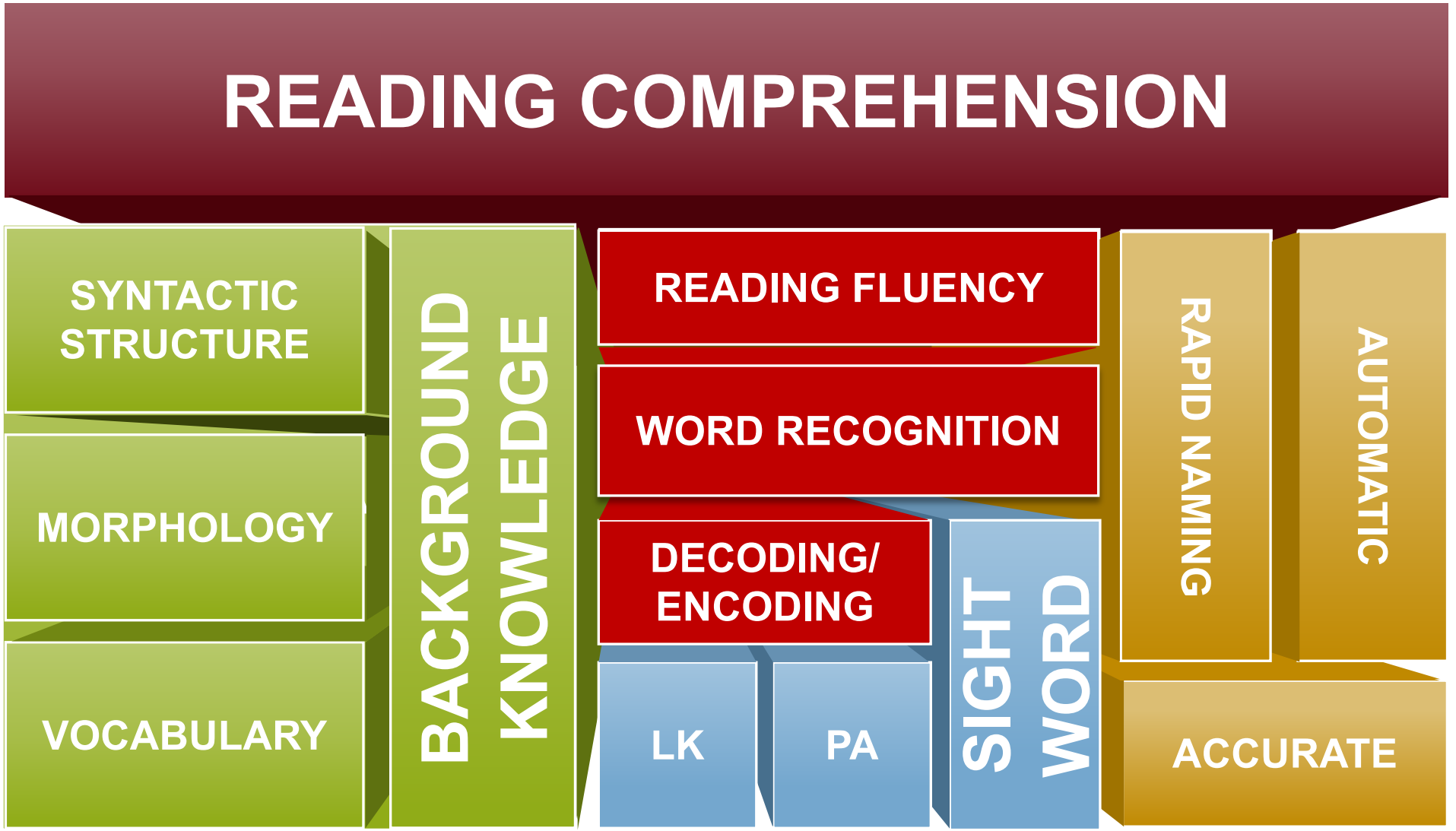

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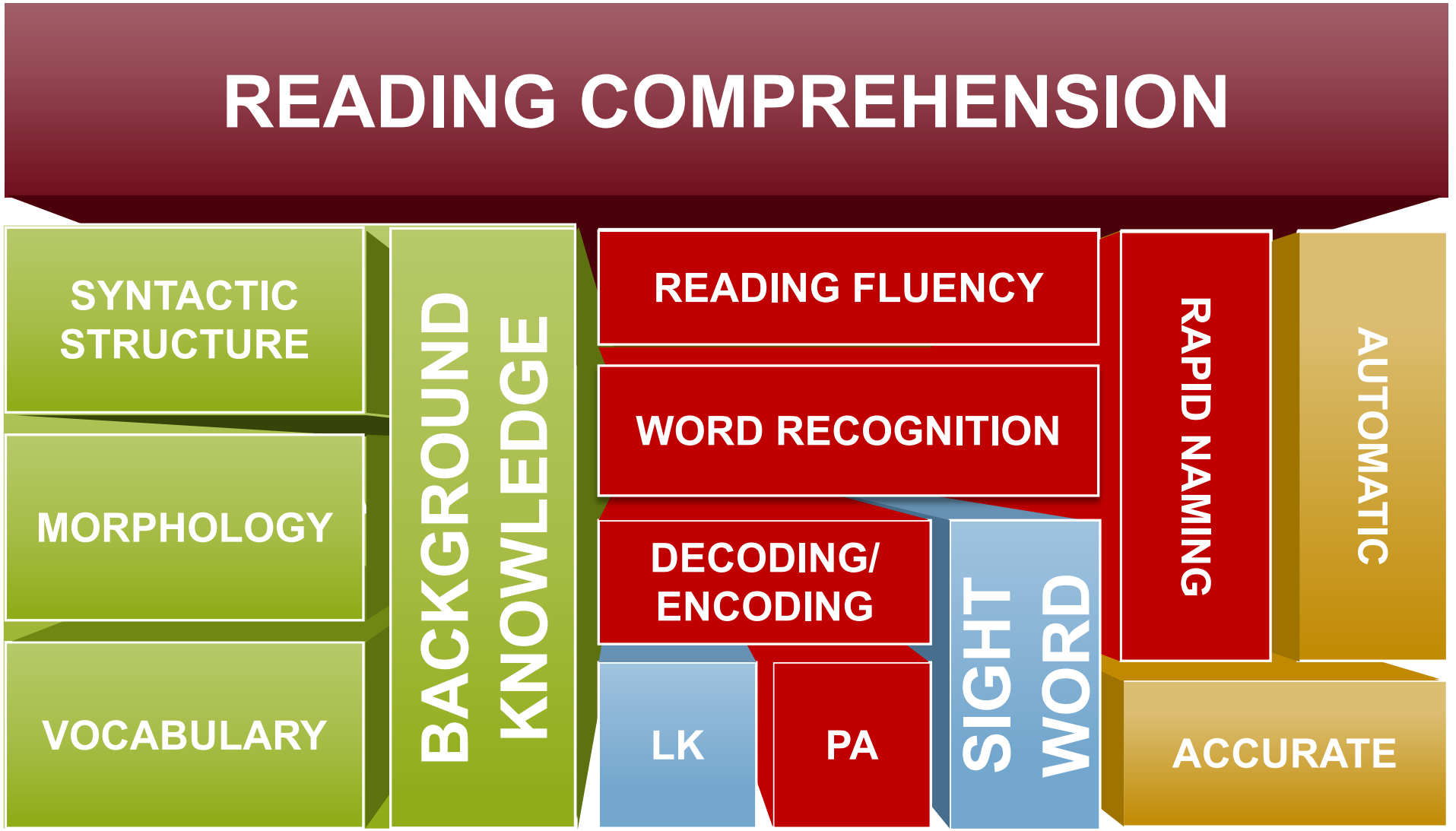

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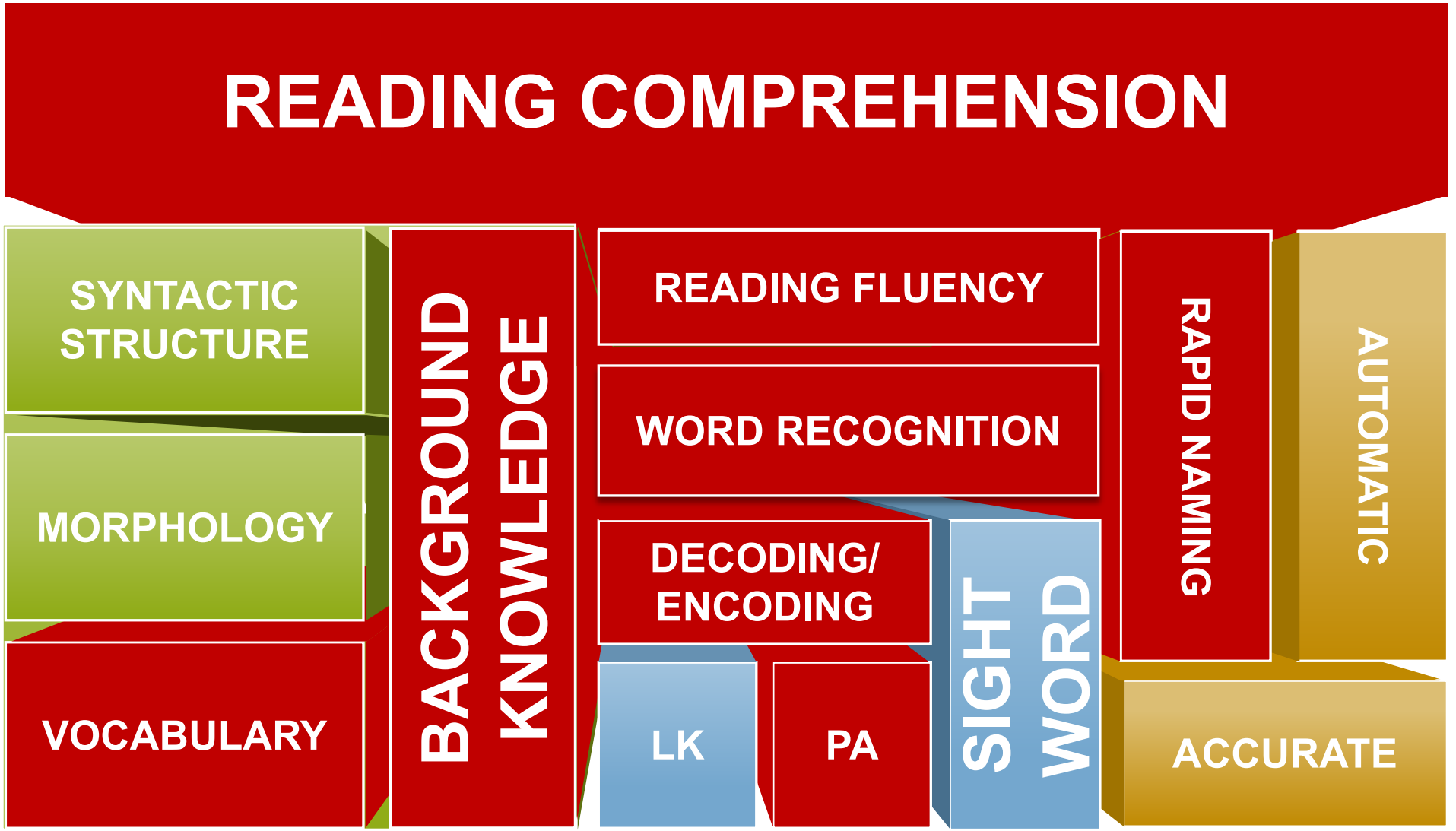
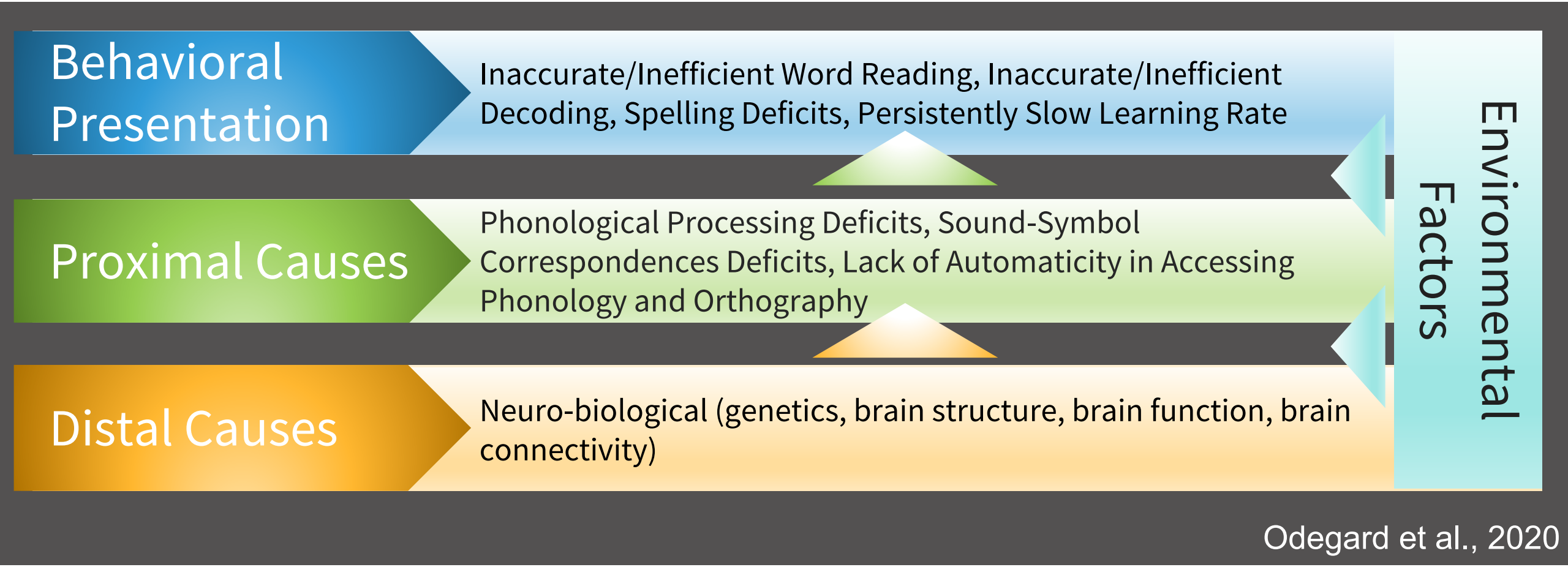


Odegard, 2016

Contemporary Model of Dyslexia

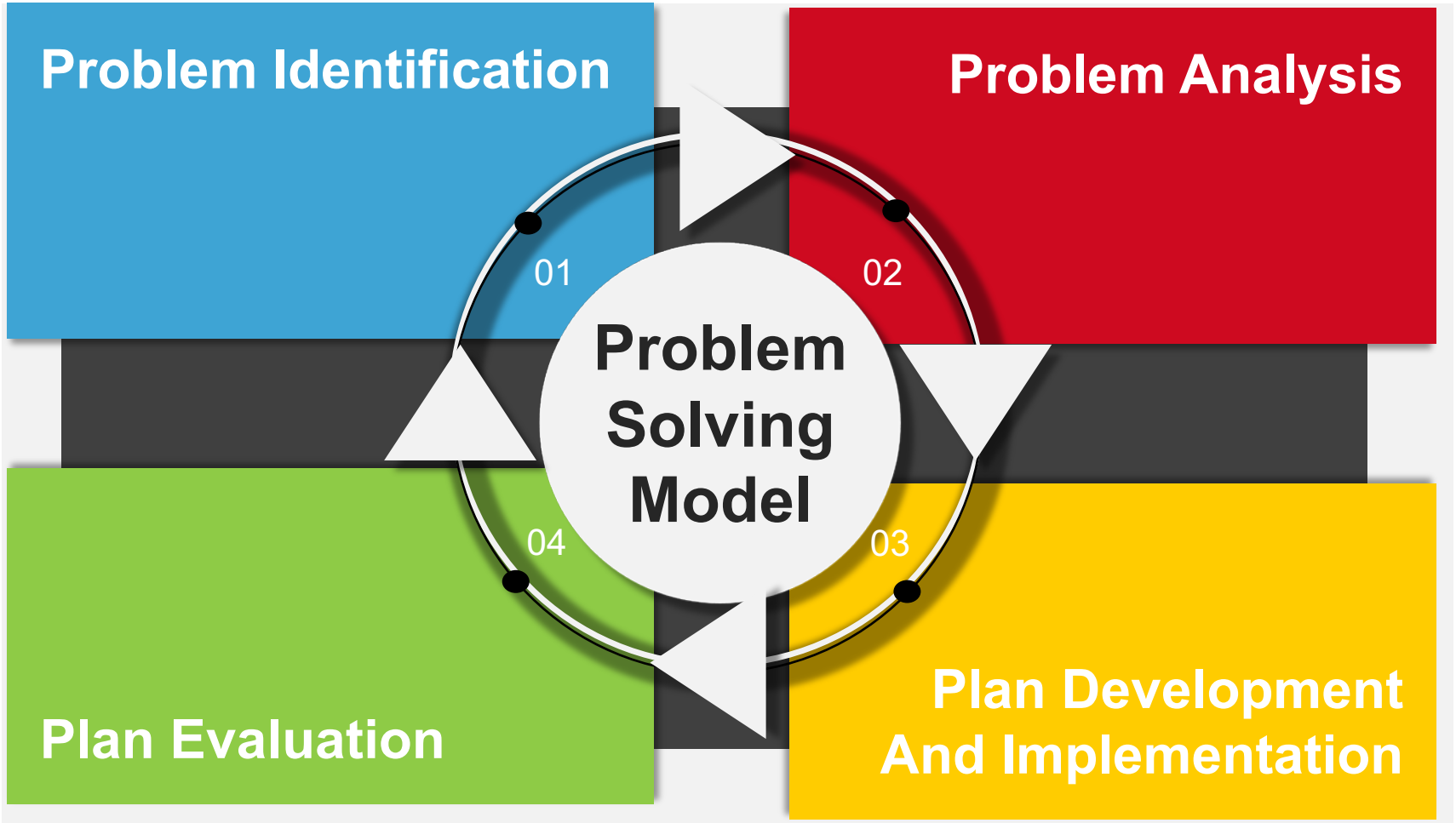


Graphic was developed based on the conceptual understanding of learning disabilities outlined in Fletcher et al., 2018. A similar and expanded understanding of dyslexia is described in Catts & Petscher, 2021.

Section 2

Screening for the risk of dyslexia and its primary characteristics

Problem Solving Approach to Instruction and Intervention



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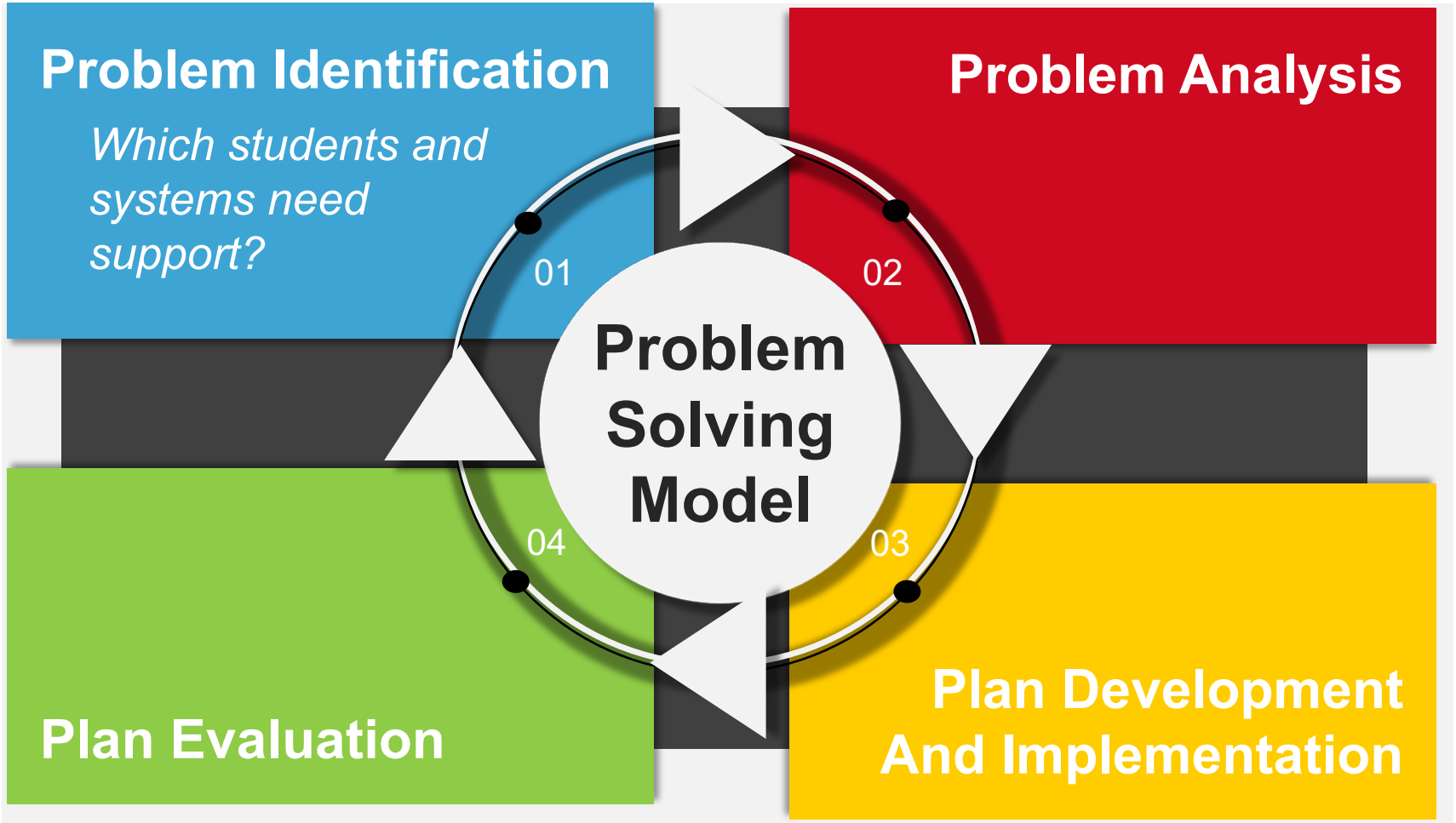
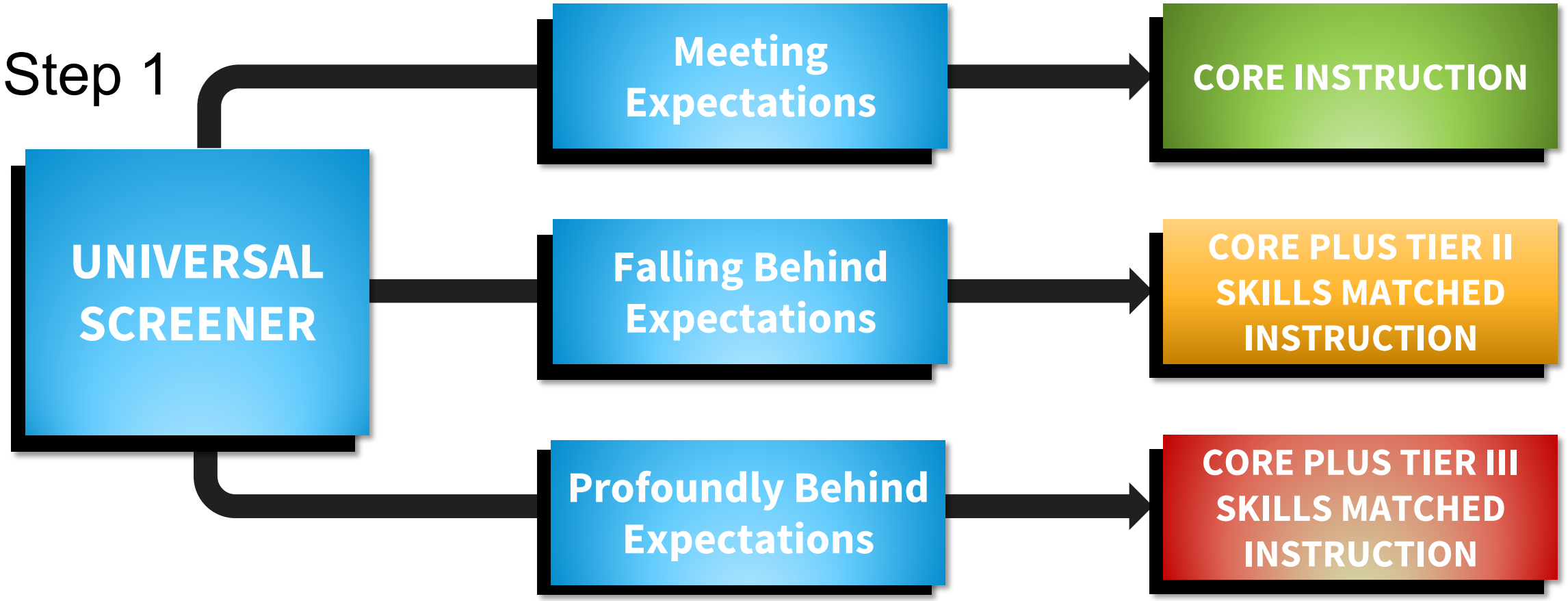


Problem Identification: Universal Screening



Universal Screening *- All students in a grade are tested at designated points during the school year (e.g., beginning, middle, end).*

Universal Screening

Screening assessments are formal tests that provide a quick indicator of student skills to reveal which students are predicted to meet grade-level benchmarks now and in the future.

Diagnostic Assessment

Progress Monitoring

Outcome Evaluation

Characteristics of Effective Screeners

Valid, Reliable, Diagnostic Accuracy

A valid and reliable screener is selected, as well as other measures for diagnostic assessment. A *valid* measure assesses what it is intended to measure. A *reliable* measure assesses a construct consistently over time.

Screen all Students

A universal screener should be administered to all students in a grade level at multiple points during an academic year. Ideally 3 times (fall, winter, spring). At a minimum, it should be administered 2 times.

Quick and Easy

Measures should be quick and easy to administer and directly measure a student's proficiency with reading and pre-literacy constructs.

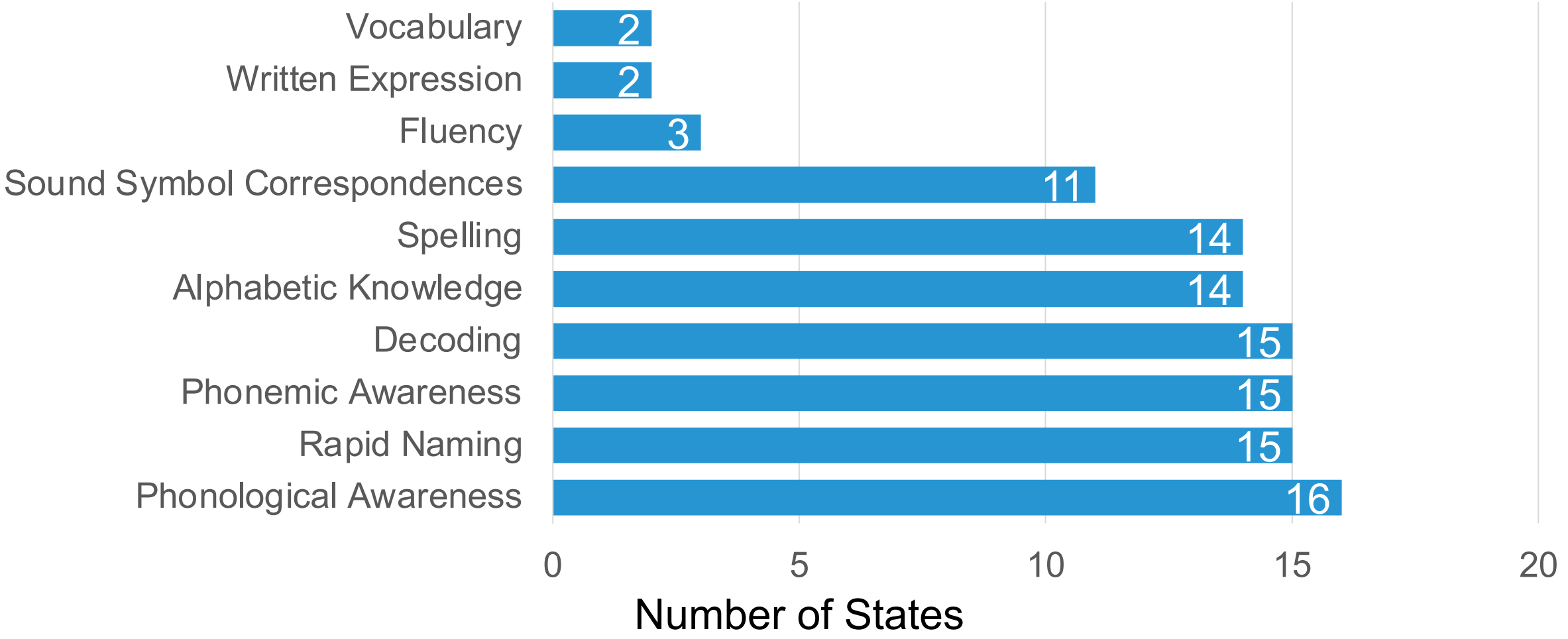
Measure Behavior

Effective universal screeners and diagnostic assessments directly measure a student's proficiency with reading and pre-literacy constructs.

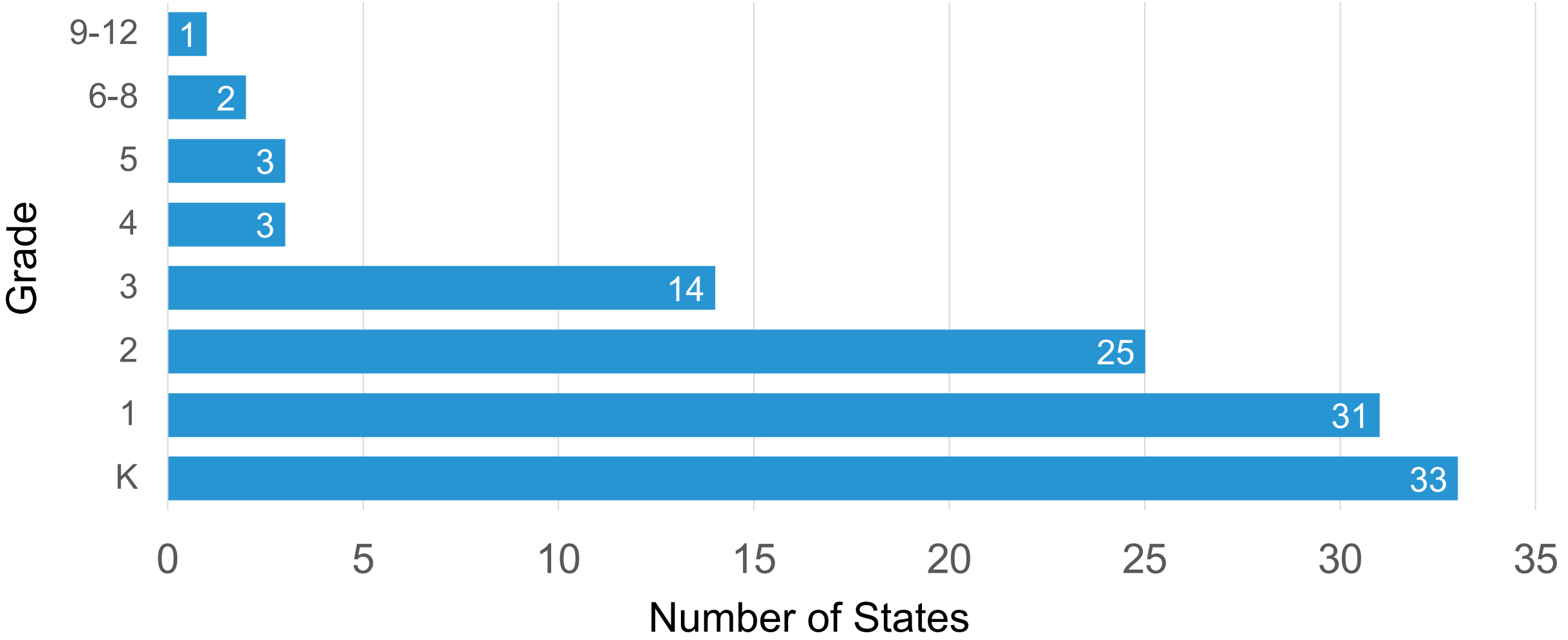
Maintain Data

Data obtained from both universal screening and diagnostic assessment should be recorded, kept, and used to document the skills and knowledge of individual students and the population of students in a grade.

Areas to Screen Based on Dyslexia State Laws



Grades to Screen for Dyslexia Based on Dyslexia State Laws

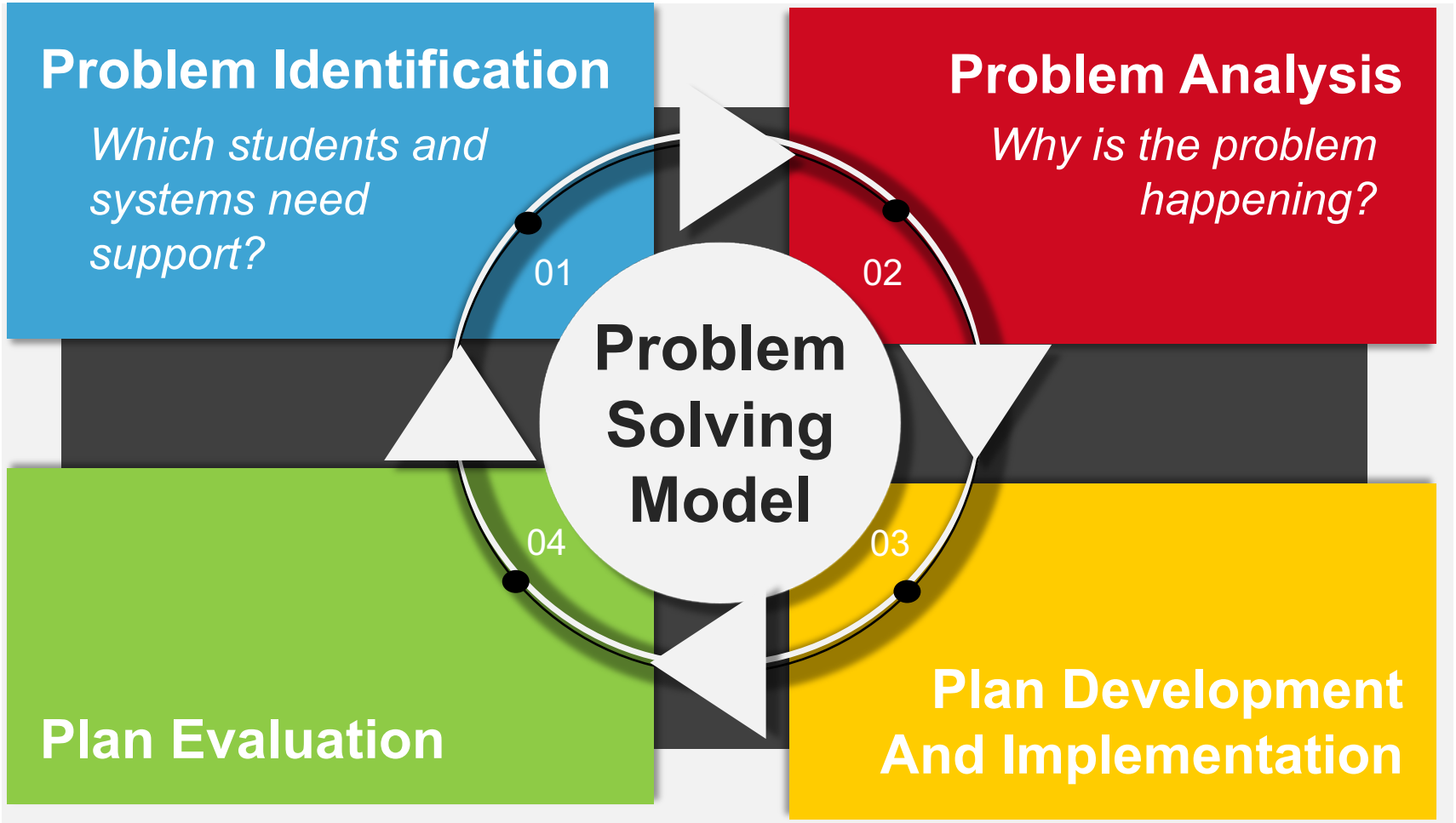


CBMs (Easy CBM, DIBELS, AIMSWEB) Reading Skills By Grade

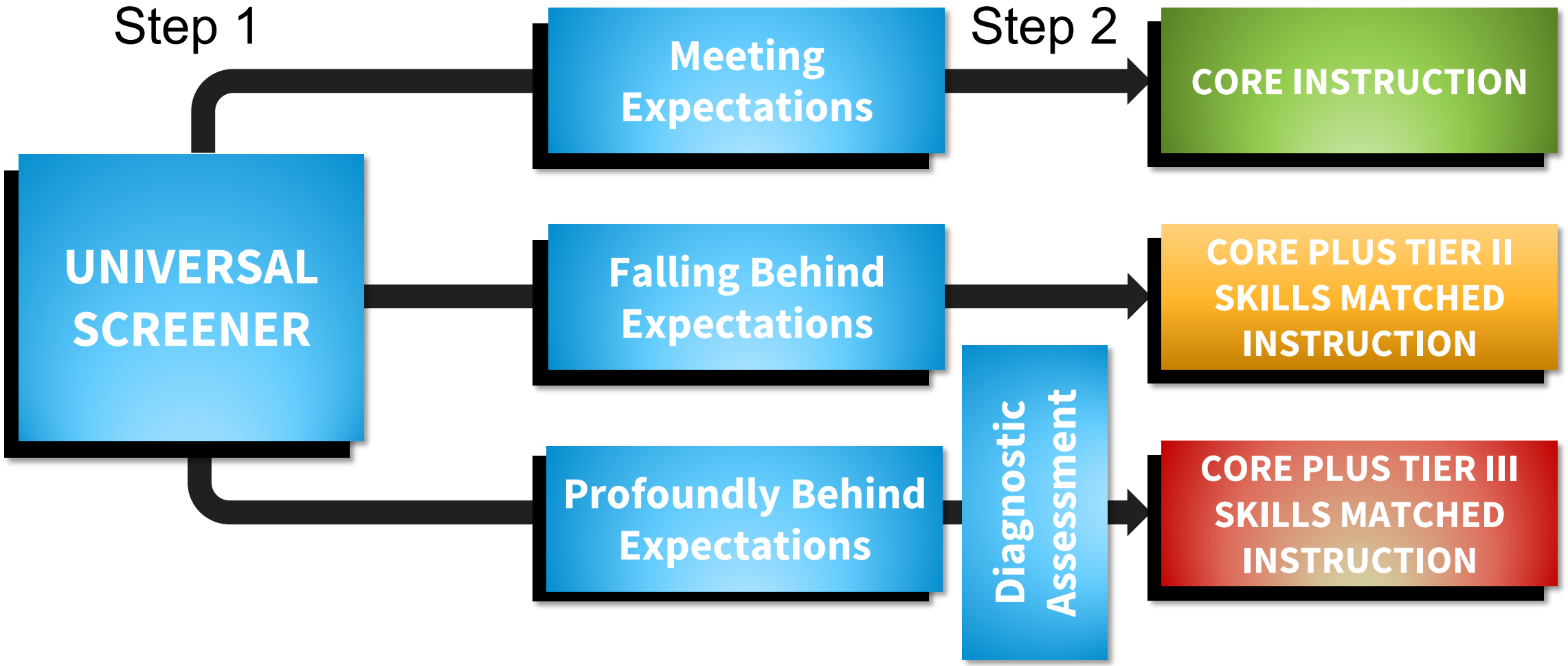
Component	K	1st	2nd	3rd	4th
Emergent print skills					
Phonological/phonemic awareness*	✓	✓			
Alphabet knowledge*	✓				
Sound-symbol recognition*	✓	✓			
Emergent comprehension skills					
Oral vocabulary	✓	✓			
Listening comprehension	✓	✓	✓		
Print skills					
Decoding**	✓	✓	≈	≈	
Word reading**	≈	✓	≈	≈	
Encoding (spelling)**	≈	✓	≈	≈	
Oral reading fluency- accuracy**	**NA**	✓	✓	✓	≈
Reading comprehension skills					
Oral reading fluency- rate**	**NA**	✓	✓	✓	≈
Reading vocabulary	**NA**	≈	✓	✓	≈
Reading comprehension	**NA**	≈	✓	✓	✓
Other sources of data					
Rapid automatic naming (RAN)*					

*dyslexia risk indicator **primary characteristic of dyslexia ✓ Yes ≈ Sometimes **NA** Not Applicable

Problem Solving Approach to Instruction and Intervention



Diagnostic Assessment



Diagnostic Assessment- *Students who score below benchmark on the universal screener are administered additional quick measures to identify there skills deficits.*

Universal Screening

Screening assessments are formal tests that provide a quick indicator of student skills to reveal which students are predicted to meet grade-level benchmarks now and in the future.

A diagnostic assessment provides more in-depth information to identify underlying skills and sources of knowledge potentially hindering a child's performance on the universal screener.

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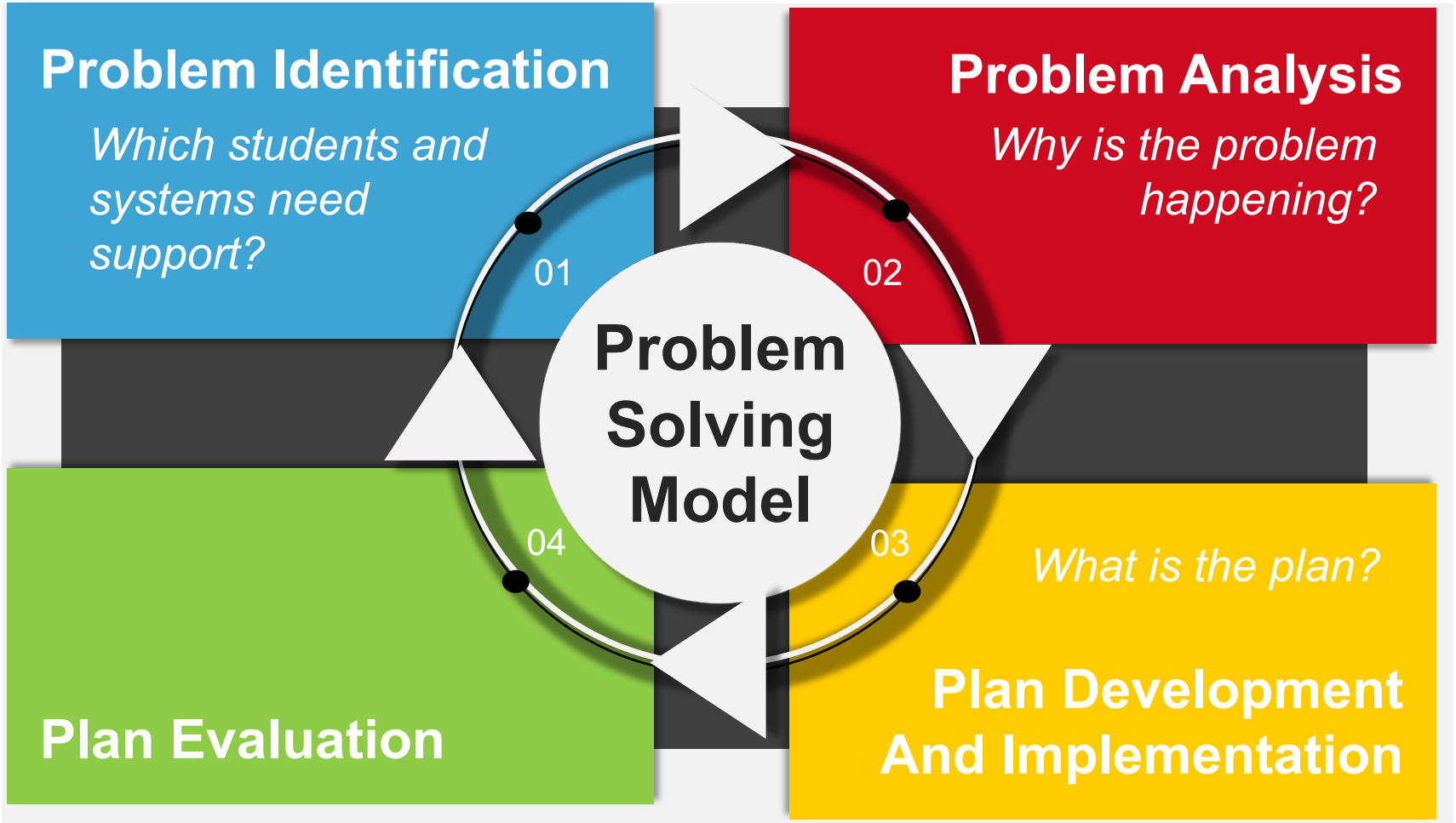

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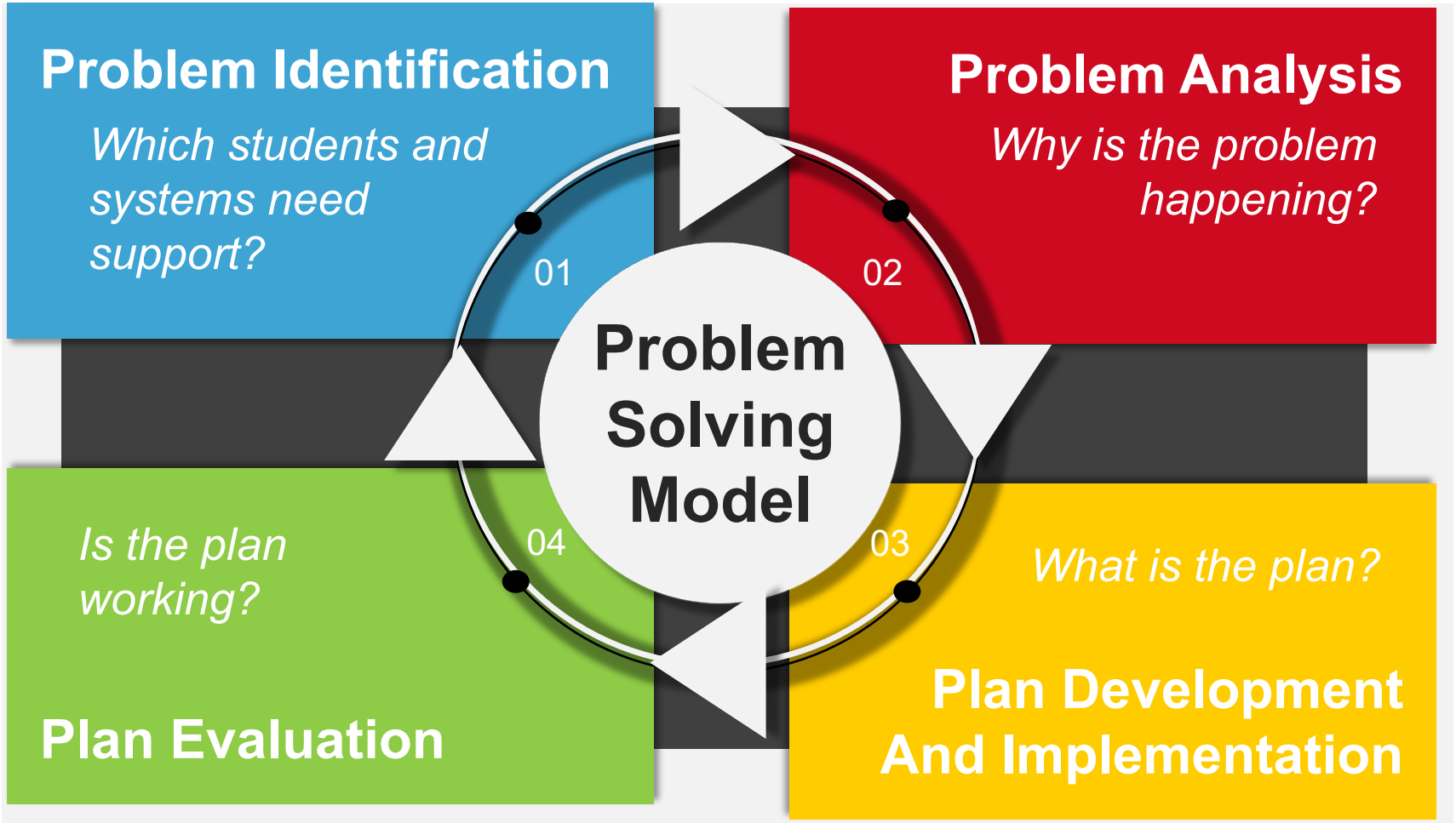

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Diagnostic Assessment

A diagnostic assessment provides more in-depth information to identify underlying skills and sources of knowledge potentially hindering a child's performance on the universal screener.

Progress Monitoring

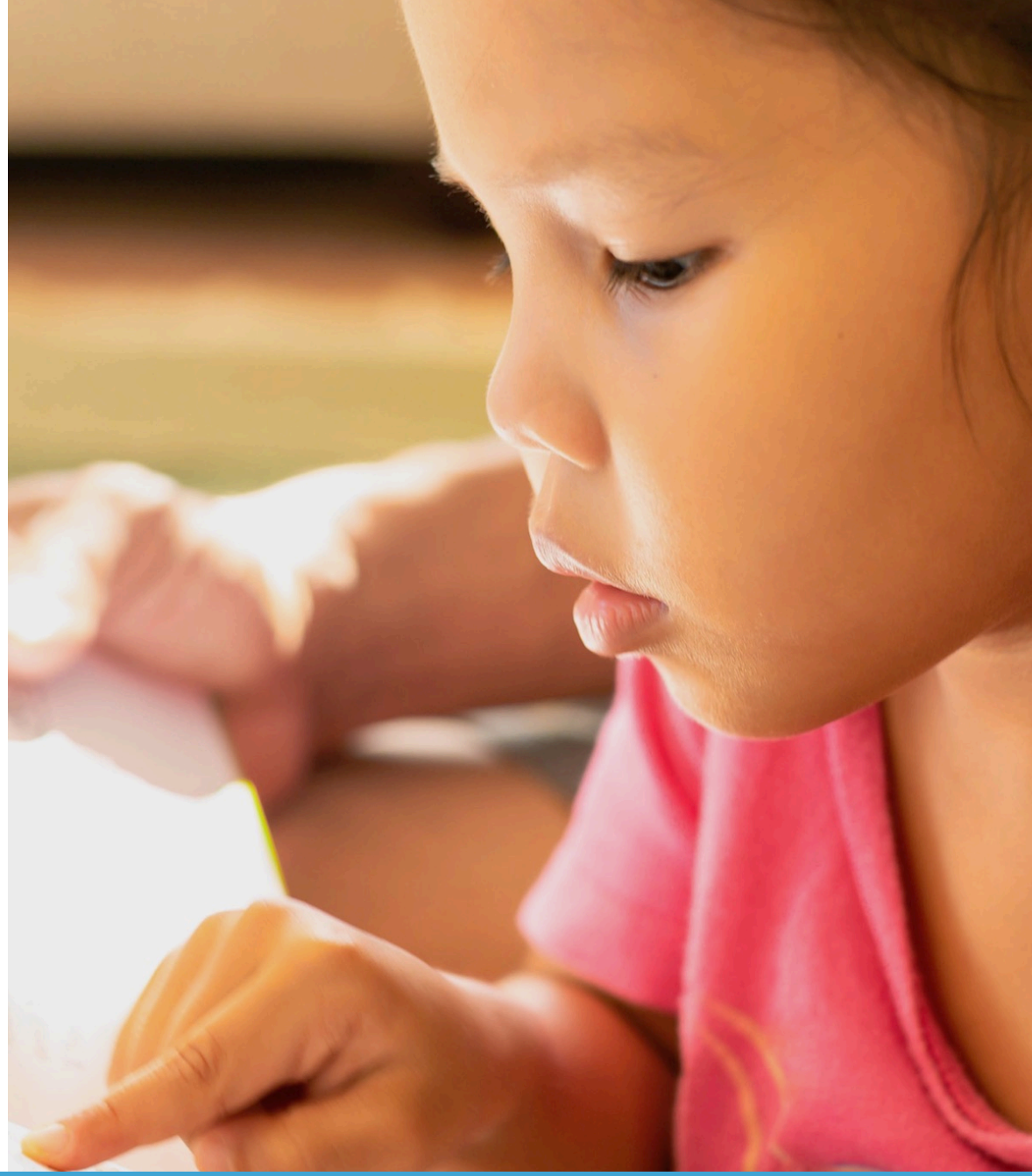
Quick assessments are collected frequently over time to determine if modifications are needed to intensive instruction to improve learning for a student receiving intensified instruction or intervention.

Outcome Evaluation

Measures that provide outcome data for a group of students to determine if they have learned what has been taught. These can be summative assessments linked to a curriculum or state standards.

Keys to Success

- Screen all students for current literacy deficits as well as future risk of deficits.
- Calibrate screening and diagnostic assessment to identify well-documented literacy profiles, including dyslexia.
- Use diagnostic assessment to look more closely at the specific skills deficits of students below benchmark on the universal screener and plan instruction.



Learn the Science of Reading

- 7–10-week online course that teaches foundational skills and instructional practices based on the science of reading
- Learn to understand and recognize dyslexia and its warning signs
- Learn the structure of the English and Spanish language system
- Includes the *Teaching Reading Sourcebook* and *Assessing Reading: Multiple Measures textbooks*
- Available for graduate credit

www.corelearn.com/online-elementary-reading-academy

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December 6, 4:00 p.m. ET
The Knowledge Gap: What It Is and How to Narrow It

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