

INDIANA DEPARTMENT OF EDUCATION

Indiana's Priorities for Early Literacy

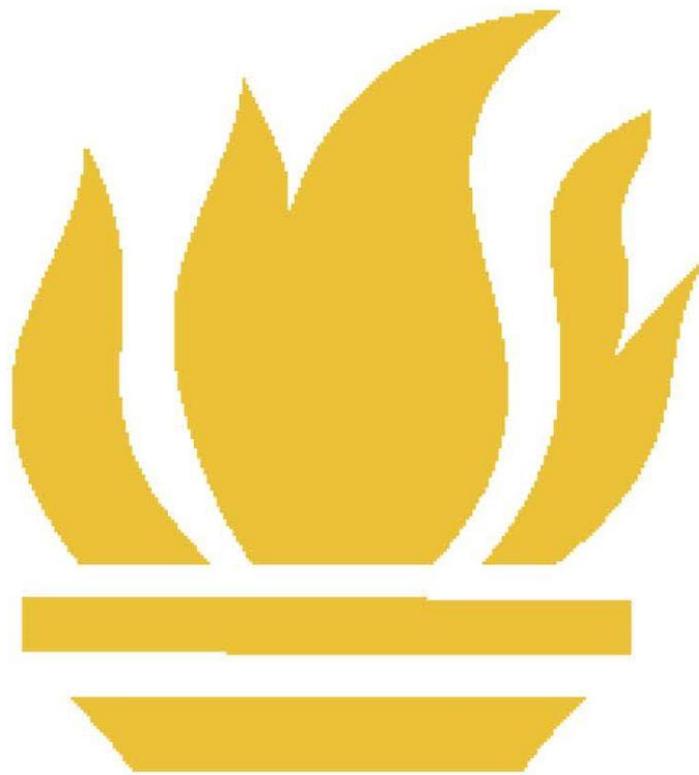


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Executive Summary

Indiana policy efforts have brought additional focus to reading since 2010. Early legislative initiatives emphasized the importance of students mastering foundational reading skills by the end of grade three to foster academic success in grade four and beyond.

Indiana's students demonstrated promising results following the implementation of new reading policies with *Pass* performance averaging 85% on IREAD-3, Indiana's grade three reading assessment. However, Good Cause Exemptions granted to large numbers of special education students and English learners led to diminished long-term success for many of these students. Furthermore, the academic impact of the COVID-19 pandemic resulted in decreased performance on both IREAD-3 and the English/Language Arts portion of Indiana's annual ILEARN assessment, which assesses grade-level Indiana Academic Standards for reading and writing. Black, Hispanic, special education, and English learner populations have been the most impacted by the pandemic.

To better serve students who were historically underserved and help mitigate the academic impact of the pandemic, Indiana will support the implementation of research-based practices aligned with the Science of Reading framework. The Science of Reading is not a program or curriculum in itself, but offers a research-based and multi-faceted approach to reading instruction.

To help schools implement the Science of Reading framework, Indiana will train instructional coaches in school corporations based on criteria identifying student populations of greatest need. Implementation of the coaching model will begin in fall 2022, with ongoing research efforts aimed at ensuring sustainability of this model long term.

NOTE: The Indiana Department of Education developed this document in collaboration with Indiana educators and key stakeholders. It was informed by conversations with other external state agencies navigating literacy policy along with internal state agencies driving essential priorities for Indiana students.

Section 1: Introduction and Overview

Indiana's Vision and Mission for Literacy Achievement

Vision:

The Indiana Department of Education (IDOE) will collaborate with Indiana educators to implement and apply the principles of the Science of Reading framework beginning in early learning to increase student literacy achievement and develop graduates prepared to succeed.

Mission:

Indiana's Priorities for Early Literacy seeks to create a collaborative and sustainable model of preparing, educating, and supporting Indiana educators on the Science of Reading framework and the importance of early literacy. IDOE will support this achievement by facilitating high-quality, ongoing, data-driven, professional development at the school- and teacher-levels. This includes partnering with teacher preparation programs to strengthen the pipeline of highly-qualified teachers to Indiana classrooms.

Literacy Defined:

Literacy involves a continuum of learning that enables individuals to achieve their goals, develop their knowledge and potential, and participate fully in their community and wider society. Literacy is a means of identifying, understanding, interpreting, and creating the communication of facts, ideas, and well-formulated opinions. These skills are essential in our increasingly digital, information-rich, and fast-changing world (Montoya, 2018).

Guiding Principles:

The following principles serve as the foundation for Indiana's Priorities for Early Literacy. IDOE seeks to empower all Indiana educators with the philosophy represented by these guiding principles. Prioritizing these principles will advance literacy education for all Indiana students from birth to adulthood:

- Literacy is acquired beginning at birth;
- Literacy is a fundamental part of the human experience;
- Literacy is a trait that requires and creates a connection (i.e., relationship) with others;
- Literacy empowers individuals to learn and self-advocate; and
- Literacy is the collective responsibility of every individual in a community to foster communication through information exchange.

Providing Context: Prior Initiatives to Improve Indiana's Literacy Performance

Since 2010, Indiana has implemented several policies to improve literacy skills for students. To start, the Indiana General Assembly enacted IC 20-32-8.5-2, which requires the evaluation of foundational reading standards at the end of grade three. Pursuant to this legislation, IDOE collaborated with Indiana educators to develop the Indiana Reading Evaluation and Determination (IREAD-3) assessment. IREAD-3 is a multiple-choice assessment measuring foundational reading standards that is administered to grade three students each spring. In 2013, Indiana required that schools provide all students enrolled in kindergarten through grade three a daily minimum of 90 minutes of uninterrupted, dedicated literacy instruction using a research-based core reading program. A school's reading program must reflect a scope and sequence to scaffold the instruction of scientifically-based reading, including phonological awareness, phonics, fluency, vocabulary, and comprehension.

In April 2017, the Indiana State Board of Education (SBOE) outlined additional flexibility that schools may use when organizing students for instruction based on IREAD-3 performance while still maintaining requirements to ensure all students attain foundational reading skills. The updated guidance allows schools to determine whether a student who does not pass IREAD-3 should be retained in grade three or placed in grade four to receive grade three reading instruction in addition to grade four content. The guidance strongly encourages schools to consider multiple data points in addition to IREAD-3 results when making decisions about grade level placement and instructional next steps for individual students. Regardless of the selected path forward,

schools must provide students who do not pass IREAD-3 with comprehensive grade three reading instruction the following school year and the opportunity to participate in IREAD-3 testing until either the student achieves a passing IREAD-3 score or the school grants the student a Good Cause Exemption. A Case Conference Committee, Individual Learning Plan, or school may grant a Good Cause Exemption upon review of a student's IREAD-3 results. Good Cause Exemptions exempt eligible students from the requirement to participate in additional IREAD-3 testing. English Learners, students with disabilities, and students who have already been retained twice are eligible for Good Cause Exemptions. Granting Good Cause Exemptions does not change students' IREAD-3 results, nor does it negate the requirement for schools to ensure students granted Good Cause Exemptions continue to receive individualized instruction to address learning gaps reflected by their IREAD-3 results and other local measures. Indiana schools grant approximately 6,000 Good Cause Exemptions for grade three students each year.

In May 2018, the Indiana General Assembly enacted IC 20-35.5 to help ensure early identification of reading difficulties. This law requires all public and charter schools in Indiana to screen all students enrolled in kindergarten through grade two for learning characteristics related to dyslexia within the first 90 days of school. The universal screener must measure the level of student achievement for six specific foundational components of reading: phonological and phonemic awareness, alphabet knowledge, sound-symbol recognition, decoding, rapid naming skills, and encoding. Once the screener is administered, schools use criteria (most often set in collaboration between the school and their test vendor) to flag students who may be at-risk for learning characteristics related to dyslexia, based on their performance on the screener. The school must share results of the screener and information about dyslexia with families of students who are flagged as at-risk. The school must also seek parents' permission to administer a level one diagnostic assessment to gather more information about the student's specific learning needs. Schools must use the level one and universal screener data to design an intervention plan using multi-tiered systems of support (MTSS) that address the skills deficits of individual students. Schools must collect data to track student performance.

Section 2: Review of Current Data and Academic Impact

This section explores assessment data that provide high-level information about Indiana's student literacy and offers broad context for Indiana's Priorities for Early Literacy. Indiana's assessments serve a variety of purposes, ranging from a national comparison of reading skills to a measurement of foundational reading skills at grade three for Indiana students. Indiana utilizes several summative assessments (e.g., ILEARN, I AM, IREAD-3) which are outlined in further detail on IDOE's website: <https://www.in.gov/doe/students/assessment/>. The following analysis defines the outcomes for four general research questions:

- What is Indiana's overall student performance for grade three reading?
- What is Indiana's performance by student population for grade three reading?
- How does Indiana's reading performance compare nationally?
- What is the academic impact on Indiana students as a result of the COVID-19 pandemic?

Indiana's Overall Performance for Grade Three Reading

The Indiana Learning and Evaluation Assessment Readiness Network (ILEARN) is Indiana's summative accountability assessment for students in grades three through eight. The ILEARN English/Language Arts (ELA) assessment measures grade-level Indiana Academic Standards for reading and writing comprehension beyond the foundational reading skills assessed on IREAD-3. While the majority of Indiana's grade three students demonstrate proficiency with foundational reading skills on IREAD-3, less than half of all grade three students attain "At Proficiency" or "Above Proficiency" performance levels on the ILEARN ELA assessment. Overall IREAD-3 proficiency rates have generally remained around 80-85% throughout the last decade. Students who do

not pass IREAD-3 remain at-risk, with specific student populations often comprising a larger portion of students who are not yet proficient readers.

Approximately 30-35% fewer students who qualified for special education services passed IREAD-3 from 2013-2021 than their general education peers. Additional student populations, including some racially and ethnically diverse populations, students receiving free/reduced lunch, and English learners have consistently performed at least 10 percentage points behind white students, students who are not economically disadvantaged, and non-English Learners, as reflected in Figures 1-4, below. While many students in these student populations (i.e., special education or English learner) qualify for Good Cause Exemptions, subsequent ILEARN and ISTEP+ data indicate these students are likely not receiving the targeted reading support they need beyond grade three.

Figure 1. 2013 IREAD-3 First Time Pass Results (Spring Only)

SPRING ONLY 2013 IREAD 3 RESULTS			
Student Demographic	IREAD PASS N*	IREAD TEST N	IREAD Pass %
American Indian	155	182	85.2%
Asian	1,487	1,720	86.5%
Black	6,449	9,093	70.9%
Hispanic	6,714	8,696	77.2%
Multiracial	3,289	3,891	84.5%
Native Hawaiian or Other Pacific Islander	44	53	83.0%
White	53,017	58,367	90.8%
Free/Reduced price meals	32,768	41,169	79.6%
Paid meals	38,870	41,546	93.6%
General Education	64,387	70,857	90.9%
Special Education	7,248	11,858	61.1%
English Language Learner	3,196	5,023	63.6%
Non-English Language Learner	68,415	77,666	88.1%
Female	35,870	40,453	88.7%
Male	35,954	42,480	84.6%
School Demographic	IREAD PASS N*	IREAD TEST N	IREAD Pass %
Public	65,723	76,495	85.9%
Non-Public	6,129	6,474	94.7%
Total	71,852	82,969	86.6%
*Totals may not match due to "Unknown" students			

Figure 2. 2013 IREAD-3 Summary Results (Spring and Summer)

SPRING & SUMMER 2013 IREAD 3 RESULTS			
Student Demographic	IREAD PASS N*	IREAD TEST N	IREAD Pass %
American Indian	149	149	89.8%
Asian	1,556	1,556	89.5%
Black	7,656	7,656	80.5%
Hispanic	7,852	7,852	85.1%
Multiracial	3,607	3,607	91.2%
Native Hawaiian or Other Pacific Islander	43	43	84.3%
White	55,692	55,692	94.3%
Free/Reduced price meals	35,964	35,964	87.0%
Paid meals	40,230	40,230	96.4%
General Education	67,994	67,994	95.6%
Special Education	8,198	8,198	68.8%
English Language Learner	3,770	3,770	74.6%
Non-English Language Learner	72,396	72,396	92.8%
Female	38,004	38,004	93.0%
Male	38,591	38,591	89.9%
School Demographic	IREAD PASS N*	IREAD TEST N	IREAD Pass %
Public	70,233	70,233	90.9%
Non-Public	6,358	6,358	97.0%
Total	76,595	76,595	91.4%
*Totals may not match due to "Unknown" students			
Students are counted in the above totals once regardless of how many times they attempted the test.			

Figure 3. 2021 IREAD-3 First Time Pass Results (Spring Only)

SPRING ONLY 2021 IREAD 3 RESULTS			
Student Demographic	IREAD PASS N*	IREAD TEST N	IREAD Pass %
American Indian	94	130	72.3%
Asian	2,076	2,557	81.2%
Black	5,353	9,837	54.4%
Hispanic	6,409	10,382	61.7%
Multiracial	3,213	4,314	74.5%
Native Hawaiian or Other Pacific Islander	48	80	60.0%
White	42,666	51,974	82.1%
Free/Reduced price meals	24,899	38,192	65.2%
Paid meals	34,939	41,046	85.1%
General Education	53,921	66,273	81.4%
Special Education	5,917	12,965	45.6%
English Language Learner	4,274	7,750	55.1%
Non-English Language Learner	55,564	71,488	77.7%
Female	30,054	38,674	77.7%
Male	29,805	40,600	73.4%
School Demographic	IREAD PASS N*	IREAD TEST N	IREAD Pass %
Public	54,547	73,242	74.5%
Non-Public	5,312	6,032	88.1%
Total	59,859	79,274	75.5%
*Totals may not match due to "Unknown" demographic information			
Spring test period only results for first time takers, does not include summer retests			

Figure 4. 2021 IREAD-3 Summary Results (Spring and Summer)

SPRING & SUMMER 2021 IREAD 3 RESULTS			
Student Demographic	IREAD PASS N*	IREAD TEST N	IREAD Pass %
American Indian	103	137	75.2%
Asian	2,178	2,600	83.8%
Black	6,378	10,284	62.0%
Hispanic	7,249	10,573	68.6%
Multiracial	3,569	4,449	80.2%
Native Hawaiian or Other Pacific Islander	53	86	61.6%
White	46,108	52,690	87.5%
Free/Reduced price meals	28,392	39,108	72.6%
Paid meals	36,429	40,465	90.0%
General Education	57,871	66,335	87.2%
Special Education	6,984	13,331	52.4%
English Language Learner	4,274	5,921	72.2%
Non-English Language Learner	60,580	73,727	82.2%
Female	32,717	39,398	83.0%
Male	32,921	41,421	79.5%
School Demographic	IREAD PASS N*	IREAD TEST N	IREAD Pass %
Public	59,978	74,683	80.3%
Non-Public	5,660	6,136	92.2%
Total	65,638	80,819	81.2%
*Totals may not match due to "Unknown" demographic information			
Students are counted in the above totals once regardless of how many times they attempted the test.			

As indicated by the data provided above, discrepancies in proficiency levels exist among various student populations, with some racially and ethnically diverse students, students in special education, students receiving free/reduced lunch, and English learners performing significantly below other student populations who completed both the IREAD-3 and ILEARN ELA assessments. These discrepancies exist among students demonstrating proficiency both with foundational reading skills and associated reading comprehension skills assessed with ILEARN ELA. Discrepancies in growth were further exacerbated by learning disruptions in 2020 and 2021 due to the COVID-19 pandemic.

Indiana Reading Performance Compared Nationally

According to the most recent data available from National Assessment of Educational Progress (NAEP), Indiana is on track with national averages in reading performance among the general population of students. However, more than half of students, both nationally and within Indiana, are performing below proficiency in reading according to NAEP's measurement levels, which are defined as basic, proficient, and advanced.

Average scale scores for NAEP reading in grades four and eight show Indiana performing slightly higher than the national average in 2019 (National Center for Education Statistics, 2021). Indiana remains higher than the national average; however, recent assessment results indicate a small decrease in performance, further emphasizing the need for additional reading support.

While Indiana is keeping with the national trend overall, more than half of Indiana grade three and eight students are performing at "NAEP Basic" and "Below NAEP Basic" levels (see charts below for percentages at each level).

Figure 6. NAEP 2019 Grade Four Performance

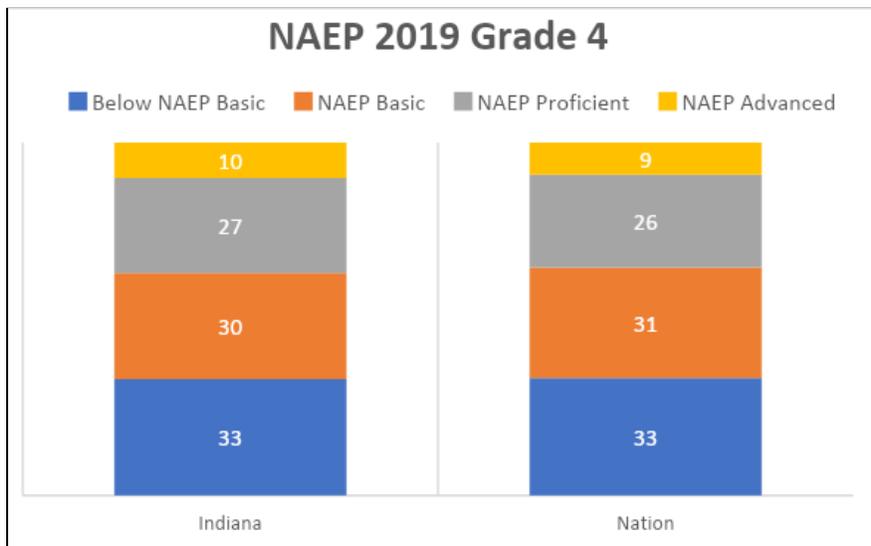
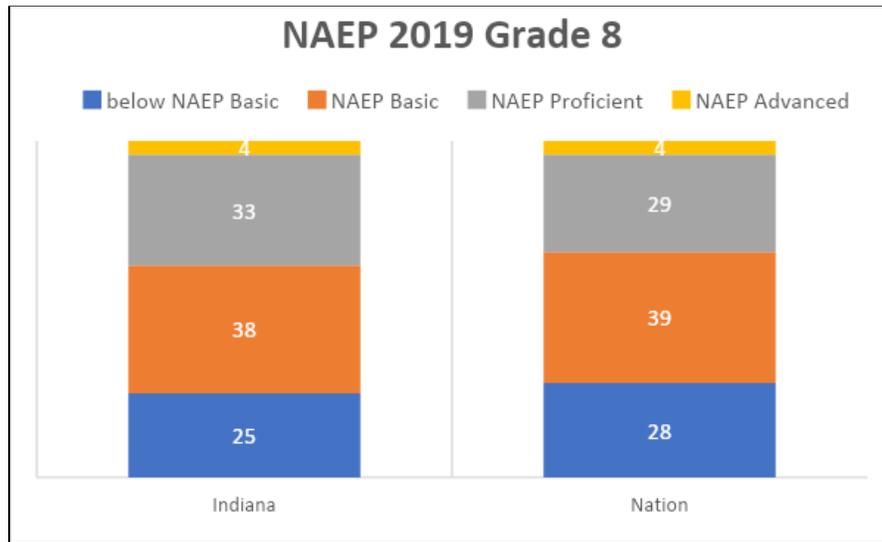


Figure 7. NAEP 2019 Grade Eight Performance



Academic Impact as a Result of the COVID-19 Pandemic

The COVID-19 pandemic significantly impacted student learning across Indiana, exacerbating pre-existing disparities in learning. Most students experienced moderate-to-substantial impacts that may require one or more years of supplemental academic support to recover to pre-pandemic performance. In isolated contexts where modest-to-no impacts were observed, there are some concerns and questions about the efficacy of literacy instruction prior to the COVID-19 pandemic. Additional information related to IDOE’s collaborative study with the National Center for Assessment is available via the Executive Summary of the Indiana Academic Impact Analysis [here](#).

The following academic impact data reflect mathematics and ELA beginning with grade three, as it often signifies the point at which students transition from learning to read to reading to learn. Students require reading skills to access vocabulary and comprehend a wide variety of texts in mathematics, science, and other disciplines. As ELA performance is notably affected, performance in other content areas is likely also impacted.

Figure 8. Overall Academic Impact (English/Language Arts and Mathematics)

Grade	Academic Impact	
	ELA	Mathematics
3	Moderate-Significant	Significant
4	Moderate-Significant	Significant
5	Moderate-Significant	Significant
6	Moderate-Significant	Significant
7	Moderate-Significant	Significant
8	Moderate-Significant	Significant

Figure 9. Academic Impact for Special Education and General Education Learners

Special Education Status	Academic Impact	
	ELA	Mathematics
General Education	Moderate-Significant	Significant
Special Education	Moderate-Significant	Moderate

Figure 10. Academic Impact by Student Populations

Ethnicity	Academic Impact	
	ELA	Mathematics
American Indian	Moderate-Significant	Significant
Asian	Significant	Significant
Black	Significant	Significant
Hispanic	Significant	Significant
Multiracial	Moderate-Significant	Significant
Native Hawaiian or PI	Moderate-Significant	Significant
White	Moderate-Significant	Significant

Figure 11. Academic Impact for English Learners and Non-English Learners

English Learner Status	Academic Impact	
	ELA	Mathematics
English Learner	Significant	Significant
Non-English Learner	Moderate-Significant	Significant

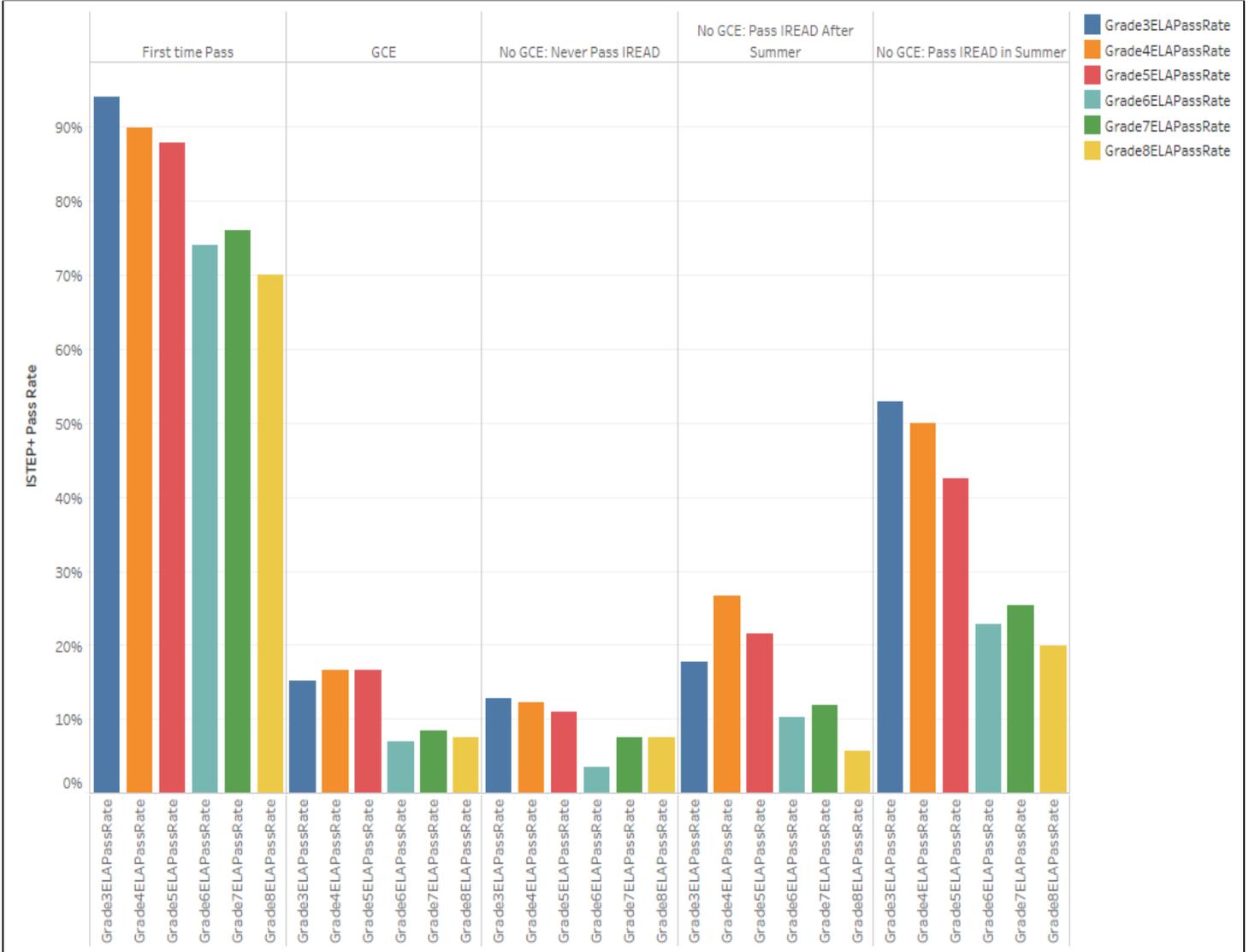
Finally, students who were granted a Good Cause Exemption following IREAD-3 showed very little difference from students who did not receive a Good Cause Exemption in passing rates (pass or fail) on future ELA ISTEP+ tests based on a cohort following students' 2012 IREAD-3 and 2017 ISTEP+ scores.

These data sets lead us to consider if students receive needed support and literacy interventions following IREAD-3 and if the support and interventions they receive are effective at improving foundational reading skills. Additionally, consideration should be given to exploring assessment options currently given to provide an early indicator in grade two for needed remediation and support.

Figure 12. ISTEP+ Performance Over Time:

ELA ISTEP+ Pass Rates by 2012 IREAD-3 Group

This graph examines a cohort of students who took the Spring 2012 IREAD-3 assessment and received "Pass" or "Did Not Pass" results. For example, the grade eight pass rate reflects students who took the grade eight ISTEP+ in 2017 and received "Pass" or "Did Not Pass" results on the Spring 2012 IREAD-3 assessment.



Current Challenges and Solutions for Improving Indiana Literacy

Specific challenges were identified in IDOE's analysis of the data, and Indiana's Priorities for Early Literacy proposes solutions to support academic recovery within Indiana based on these academic impact and performance data sets. Specifically, those challenges include:

1. Special education, English learner, racially and ethnically diverse, and economically disadvantaged student populations perform below academic peers on reading assessments.
2. Students who do not pass IREAD-3 matriculate to grade four lacking foundational reading skills, and this pattern continues throughout students' educational journey.

Therefore, Indiana will address refining core reading instruction to follow researched best practices utilizing data-based decision making; developing targeted professional development; developing targeted pre-service teacher training; and providing targeted interventions, remediation, and enrichment to ensure accessible opportunities for all students.

Priority 1: Offer Opportunity for Science of Reading Implementation throughout Indiana Schools

IDOE has been inspired by the success of several states, such as Mississippi, Louisiana, and Florida, that have improved their students' literacy achievement by implementing literacy plans aligned with the Science of Reading. The Science of Reading is a term used to describe the body of research about "reading, reading development, and best practices for reading instruction" (Petscher et al., 2020).

The first priority to increase students' literacy achievement is to implement evidence-based literacy practices based on the Science of Reading. IDOE will offer an opportunity for partnerships with teachers, schools, and corporations to align their early

literacy instruction in kindergarten through grade three with this body of research (further described in Section 3).

Priority 2: Developing Professional Educators Trained in Quality Instructional Practices for the Science of Reading

The second priority to improve students' literacy achievement is to provide coaching and professional development aligned with the Science of Reading to educators. The implementation plan allows for two consecutive efforts to identify schools for coaching: high-need schools serving racially and ethnically diverse student populations as well as those desiring to use the training and support in Science of Reading as a voluntary coalition. IDOE will define high-need schools based on IREAD-3 and ILEARN performance by student population, comparison of Good Cause Exemptions, and retest performance reflecting student support. IDOE will procure and oversee coaches to support these schools over a two-year period. Coaches will offer support and guidance as well as provide professional development and coaching to empower educators in the implementation of the Science of Reading and the evidence-based instructional practices aligned with it. For those schools engaging in the voluntary coalition, literacy coaches within the school will receive training from IDOE directly.

Priority 3: Increase Access to Quality Interventions, Remediation, and Enrichment for All Students

The third priority to improve students' literacy achievement is to provide a framework for quality interventions, remediation, and enrichment using the Science of Reading and thoughtfully trained coaches. The academic impact of the COVID-19 pandemic further draws attention to the lower rates of achievement for special education, English learner, racially and ethnically diverse, and economically disadvantaged student populations. Providing educators serving these student populations with training in the Science of Reading and other quality resources will increase access to meaningful intervention and remediation experiences for all students.

Section 3: Science of Reading, Structured Literacy, and Balanced Literacy

The purpose of this section is to provide an overview of the body of research known as the Science of Reading for education professionals and other stakeholders in Indiana. This research underlies Indiana's Priorities for Early Literacy.

The Science of Reading Defined

The Science of Reading is a term used to describe the body of research about “reading, reading development, and best practices for reading instruction” (Petscher et al., 2020). There are several important facts about this body of research (Defining Movement, 2021; Petscher et al., 2020):

1. **It is interdisciplinary.** These studies have been conducted by numerous independent researchers from separate, but connected, fields such as education, psychology (e.g., cognitive, developmental, school), linguistics, neuroscience, implementation science, etc.
2. **It is substantial and well-established.** It encompasses thousands of studies that have been conducted over the past 50 years.
3. **It is high-quality and scientifically-based.** These studies use methods and procedures that are “rigorous, systemic, and objective” (ESSA, S.1177 - 114th Congress 2015). This means that researchers have used designs (e.g., experimental, quasi-experimental, meta-analysis, correlational) aligned with held research questions, administered assessments that are valid and reliable, employed appropriate procedures to analyze data, and reported their findings in peer-reviewed journals.

It is also important to identify some common misconceptions about the Science of Reading. “The Science of Reading is not:

- An ideology or philosophy;

- A fad, trend, new idea, or pendulum swing;
- A political agenda;
- A one-size-fits-all approach;
- A program of instruction; or
- A single, specific component of instruction, such as phonics.” (Defining Movement, 2021)

The Importance of the Science of Reading

Far too many adolescents leave school without proficiency in the literacy skills required to achieve their postsecondary goals and participate fully in their community and society (National Center for Education Statistics, 2021). Although many factors contribute to low literacy levels, it is important for schools and education professionals to focus on malleable factors. One of these factors is providing educators with high-quality professional development and training about the Science of Reading, which includes information about reading and the structure of language, reading development, and effective practices for instruction (Moats, 2020a; Seidenberg & Borkenhagen, 2020). The focus of Indiana's Priorities for Early Literacy is to help educators better understand the Science of Reading to identify and implement effective instructional practices that can prevent reading difficulties and support literacy progress.

Understanding Reading: The Simple View of Reading and Scarborough's Reading Rope

The Simple View of Reading is one model of reading that describes the component skills that contribute to reading comprehension (Gough & Tunmer, 1986; Hoover & Gough, 1990). This model is supported by substantial evidence from numerous scientific studies conducted over the past 40 years. In the Simple View of Reading, reading comprehension is viewed as the product of two component skills: decoding and linguistic comprehension (Gough & Tunmer, 1986; Hoover & Gough, 1990). Decoding, a word-level skill, involves the ability to retrieve words rapidly and efficiently from memory. For example, an individual who is proficient in decoding sees the written spelling for the word “hat” and automatically retrieves the correct pronunciation for the word (/h//ă//t/); however, decoding by itself is not sufficient for an individual to comprehend text. The

other component of the Simple View of Reading is linguistic (language) comprehension, which involves constructing and interpreting the meaning of words (Gough & Tunmer, 1986; Hoover & Gough, 1990). Linguistic comprehension requires in-depth knowledge about:

- Morphology – the smallest units of language that have meaning (i.e., prefixes, suffixes, roots, base words);
- Semantics – the meaning of words, phrases, and sentences;
- Syntax – grammatical structures and parts of speech;
- Background knowledge – prior knowledge about the subject matter;
- Verbal reasoning – inferencing, figurative language; and
- Literacy knowledge – print concepts and genres (Moats, 2020; Scarborough, 2001).

The word “simple” in the Simple View of Reading is often misleading. It does not mean that reading is a simple process, but instead identifies the two main components (decoding and linguistic comprehension) that contribute the most to overall reading comprehension. Both decoding and linguistic comprehension are necessary for individuals to comprehend text, but it is also important to understand that comprehension is the product of these two skills (Gough & Tunmer, 1986; Hoover & Gough, 1990). This means that individuals will have difficulty comprehending text if they can decode words but do not understand what those words mean or if they can understand what words mean but cannot decode them. The complexity of the Simple View of Reading is also illustrated in Scarborough’s Reading Rope (2001) — a diagram that depicts the relationship between decoding and linguistic comprehension. As individuals become more skilled at reading, they develop increasing speed and accuracy in the areas of decoding and linguistic comprehension. Additional information regarding the Simple View of Reading and Scarborough’s Reading Rope can be found below.

- [Learning to Read: The Simple View of Reading Infographic](#) (Baker et al., 2017).
- [Scarborough’s Reading Rope: A Groundbreaking Infographic](#) (International Dyslexia Association, 2019).

Reading and the Human Brain

Almost all humans are born with the natural ability to speak and listen, but they are not born with the natural ability to read and write (Moats, 2020). This is because reading and writing are relatively recent cultural inventions (approximately 5,000 to 10,000 years old), which have only become more widely used in the past 500 years (Moats, 2020). This means that the human brain is not biologically “pre-wired” for reading and writing (Dehaene, 2009), and humans must be explicitly taught to connect speech to written language (Castles et al., 2018).

Reading is a complex process, but recent advances in neuroscience and brain imaging (e.g., functional magnetic resonance imaging) have allowed researchers to identify three main areas of the brain that are involved in reading (Kearns et al., 2019):

- Frontal Lobe – The inferior frontal gyrus in the frontal lobe is responsible for processing and storing speech sounds.
- Temporoparietal Area – This area connects letters (graphemes) with speech sounds (phonemes) and processes the meaning of words and sentences.
- Occipitotemporal Area – This area is responsible for processing visual information (i.e., recognizing letters and words) and word meanings.

These areas of the brain are connected by two main pathways when individuals are reading (Kearns et al., 2019):

1. Dorsal (Decoding) Pathway – involved in sounding out letters and words.
2. Ventral (Sight Recognition) Pathway – involved in reading words accurately and automatically by sight.

Why Do These Areas and Pathways Matter?

When children first learn to read words, they mainly activate the dorsal (decoding) pathway in the brain which allows them to connect a word's sounds (phonemes) to its letters (graphemes) and meaning (Castles et al., 2018). To become proficient at word-reading (i.e., the decoding component of the Simple View of Reading), children need to automatically connect a word's letters to its meaning. When this happens, the ventral (sight recognition) pathway is activated, which is quicker and more efficient than the dorsal pathway (Castles et al., 2018). Using the ventral pathway also frees up the brain's working memory and allows children to focus on higher-level linguistic skills and text comprehension (Fletcher et al., 2018; LaBerge & Samuels, 1974; C. A. Perfetti, 1985). If children do not develop accurate and automatic word-reading skills, then they must constantly rely on the slower dorsal pathway to decode words, which can cause difficulties with spelling, word-reading, and text comprehension (Castles et al., 2018; Perfetti, 2007).

Word-Reading and Spelling Development

Although the Simple View of Reading describes the skills necessary for proficient reading, it is a fixed model, and does not describe how these skills develop over time (Hoover & Tunmer, 2018). As young children begin learning to read, they start to understand the alphabetic principle — the idea that letters (graphemes) are used to represent sounds (phonemes) in spoken words (Castles et al., 2018; Scarborough, 2001). This understanding that phonemes map to graphemes develops across several phases/stages (Castles et al., 2018; Ehri, 1998):

- **Pre-Alphabetic** – pre-reading stage when young children do not make letter-to-sound connections; “reading” is based on visual cues.
- **Partial Alphabetic** – children begin to connect some phonemes to graphemes, but these representations are not complete.

- **Full Alphabetic** – children develop more complete representations of words and their phoneme-grapheme relationships.
- **Consolidated Alphabetic** – individuals have acquired a large bank of words they can read by sight (i.e., automatically and accurately) and now recognize larger units of language in words such as syllables and morphemes.

Children progress across similar developmental phases/stages for spelling (Ehri, 2005; Treiman & Kessler, 2005); however, spelling is often more difficult for children to acquire than word-reading (Bosman & Van Orden, 1997; Ehri, 2000; C. A. Perfetti, 1997; Treiman, 2017). Spelling requires children to learn to visually identify letters by their shape and to physically produce those shapes (Treiman & Kessler, 2005). Proficient spelling also requires individuals to acquire in-depth knowledge about phonological (sound), graphotactic (written), and morphological (structure) patterns in words (Treiman, 2017).

Word-reading and spelling are complementary processes (Ehri, 2000). In other words, learning about spelling facilitates word-reading and vice versa. As children repeatedly associate phonemes to graphemes and larger units of language (also known as orthographic mapping), these associations become ingrained in the memory and easier to retrieve with automaticity (Ehri, 1998; Ehri, 2005). Formal spelling instruction has also demonstrated significant, positive effects on students' reading achievement (Graham & Santangelo, 2014).

Scientifically-Based Reading Instruction

In addition to research about reading and reading development, the Science of Reading includes numerous scientific studies about effective reading instruction and intervention, including what to teach (content) and how to teach it (methods and practices). The results from these studies have been synthesized in numerous systematic reviews and meta-analyses and have important implications for teaching literacy to students in grades K-12. One approach to literacy instruction that is aligned with the Science of Reading and incorporates these effective, scientifically-based literacy practices is

known as Structured Literacy. In section three, we described Structured Literacy approaches and contrasted them with typical or balanced approaches commonly used in classrooms.

Instructional Implications of the Science of Reading for Early Learning

Developing language and early literacy skills begins during early learning efforts; consequently, Indiana's priorities are designed to reach all children, including those from infancy to age five and not yet in a K-12 setting. All of the domains of a child's early development are interrelated and interdependent. Therefore, a wider focus on all foundational content areas is necessary, as language and early literacy development does not just live in the "English/Language Arts" Early Learning Foundation. Yet, access to a high-quality, evidence-based, early childhood curriculum aligned to Indiana's Early Learning Foundations can be cost-prohibitive for many early learning providers. Early literacy does not mean early reading instruction or teaching infants to read; it is the natural development and progression of a variety of skills. It is the importance of positive interactions between infants and families as well as the critical role of literacy-rich experiences, based on principles in high-quality, early learning curricula. It is the development of oral language and learning the meaning of words. As referenced earlier, background knowledge is critical for young children beginning to read. When children are not familiar with a word, they will not hold context or meaning to understand what it is, and therefore will read without comprehension. While the Science of Reading calls for explicit instruction, this must be balanced in early childhood with time and space for children to play. Play is when children develop and improve oral language skills, which culminates in incorporating what they have learned into group time with educators.

Instructional Implications of the Science of Reading in Grades Three through 12

The Science of Reading has implications for improving literacy for students in grades three through 12. It is critical that educators working with older students develop their knowledge about evidence-based instructional practices to improve literacy; therefore,

IDOE plans to compile professional development resources related to the Science of Reading accessible to teachers, schools, and corporations serving all grade levels.

Structured Literacy Defined

Structured Literacy (SL) is a scientifically-based approach to literacy instruction that is aligned with the Science of Reading and the body of research on effective instructional practices for all learners (International Dyslexia Association, 2019b; Spear-Swerling, 2019). Educators who use a Structured Literacy approach teach all components of language (the content), including phonology, sound-symbol relationships, orthography, morphology, syntax, and semantics (International Dyslexia Association, 2019b). These components of language also overlap considerably with the essential components of reading identified by the National Reading Panel's report on reading instruction (National Reading Panel, 2000):

- **Phonemic Awareness** – the ability to identify, think about, and manipulate the smallest sounds (phonemes) in language;
- **Phonics** – a method for teaching phoneme-grapheme correspondences for reading and spelling;
- **Fluency** – the ability to read a text accurately, automatically, and with expression;
- **Vocabulary** – understanding and using words in oral and written language; and
- **Comprehension** – the ultimate goal of reading: understanding what is read.

It is important to note that each of these components are highly-connected and should not be taught as distinct skills. For example, phonemic awareness, phonics, and fluency are a part of decoding or word recognition in the Simple View of Reading, whereas vocabulary is a part of linguistic comprehension. Comprehensive literacy programs that use a Structured Literacy approach emphasize the aforementioned components of language and reading.

Essential Features of Structured Literacy Methods

In Structured Literacy, content is taught with specific methods containing the following key features:

1. **Explicit and Direct** – Lessons are fully-guided, which means that teachers clearly explain learning goals, provide adequate models and demonstrations, scaffold students' learning through guided and supported practice, and provide appropriate independent practice (Archer & Hughes, 2010; Clark et al., 2012). Teachers never expect students to guess or infer the skills or content to be learned (Clark et al., 2012).
2. **Systematic** – Lessons are highly-structured with a planned scope and sequence (International Dyslexia Association, 2019a).
3. **Sequential** – Skills in lessons are sequenced logically (i.e., easier or prerequisite skills are taught before more difficult skills), and each lesson builds upon previously taught skills (Archer & Hughes, 2010).
4. **Cumulative with On-Going Review** – Lessons include frequent opportunities to review previously learned skills alongside new skills (Archer & Hughes, 2010; International Dyslexia Association, 2019b).
5. **Interactive** – Lessons provide frequent opportunities for students to respond and interact with the teacher (Archer & Hughes, 2010; Wanzek et al., 2014).
6. **Immediate Feedback** – Teachers provide immediate feedback that is specific and goal-directed to help students improve their performance (Archer & Hughes, 2010; Hattie & Timperley, 2007).

Structured Literacy and Balanced Literacy in Elementary Classrooms

Balanced (or typical) approaches to literacy instruction are commonly implemented in many elementary classrooms. These approaches may lack the essential content and methods aligned with the Science of Reading that are necessary to improve students'

reading achievement (Moats, 2007). These approaches are often based in the whole language theory of reading and three-cueing system, which emphasize meaning-based instruction and the belief that readers use cues (e.g., semantic, syntactic, and graphophonic) to pronounce words (Hempenstall, 2014). When a student comes to an unknown word, the teacher may ask the student to use these cues to figure out how to pronounce the word: “Does it make sense? Does it sound right? Does it look right?” Instead of reading decodable books with previously taught letter-sound, students practice reading predictable, leveled, or trade books (Spear-Swerling, 2019). These predictable and leveled texts include many unfamiliar words, and teachers may tell students to look at the pictures to figure out how to read these unknown words. Additionally, critical phonemic awareness and decoding skills may be taught, but are rarely done so in an explicit, systematic, or sequential manner (Spear-Swerling, 2019).

Balanced or typical approaches to literacy instruction may also use instructional practices and learning activities that are only partially-guided, and therefore require students to infer or implicitly learn various reading skills. Students often spend most of the reading block working with partners or independently to practice reading skills (Moats, 2007; Spear-Swerling, 2019).

Examples of the Science of Reading Initiatives Across the U.S.

Over the past decade, several states and school corporations have implemented Science of Reading initiatives designed to improve their elementary-age students' literacy achievement. In 2011, 78% of Mississippi's grade four students scored below the NAEP-proficient level in reading (National Center for Education Statistics, 2021). Their grade four students scored higher than only one other state, New Mexico, as well as the District of Columbia. As a result, the state enacted a new law, the Literacy Based Promotion Act (*Literacy Based Promotion Act. Mississippi State, 2013*), which included training in scientifically-based reading instruction and intervention (aligned with the Science of Reading) for pre-service and in-service teachers and higher-education faculty, in addition to reading coaches to support teachers in the field. Since this law was implemented, Mississippi's grade four students have demonstrated significant

improvements on the NAEP reading assessment (RMC Research Corporation, 2019). As of 2019, 68% of their grade four students scored below the proficient level in reading on NAEP, and Mississippi was the only state in the nation to see a significant improvement in grade four reading achievement from the 2017 to 2019 administration of NAEP (National Center for Education Statistics, 2021).

Similarly, in 2015, the chief academic officer for Bethlehem School District in Bethlehem, Pennsylvania, noticed that more than half of the grade three students in the district were at or below the proficient level on their statewide reading assessment (Hanford, 2018). They implemented a plan to train principals and teachers in the Science of Reading, specifically using Language Essentials for Teachers of Reading and Spelling (Moats & Tolman, 2019), and also discontinued using Balanced Literacy programs and practices (Hanford, 2018). Kindergarten students were assessed annually using a literacy screening assessment known as the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) (University of Oregon, 2021). In 2015 (before implementing the Science of Reading-aligned training), only 47% of kindergarteners were at or above the benchmark level on DIBELS; however, by 2018 (after implementing the Science of Reading- aligned training), 84% of kindergartners were at or above the benchmark level (Hanford, 2018).

It is important to note that the findings from Mississippi and Bethlehem School District are not from experimental studies. This means that the Literacy Based Promotion Act and Language Essentials for Teachers of Reading and Spelling training did not *cause* improved reading achievement, but they were *positively associated* with improved reading outcomes for students. Without experimental control, it is impossible to know what other external factors may have influenced reading achievement in this state and district; however, these results do highlight important considerations for other states and districts as they move to align their instructional practices with the Science of Reading.

Section 4: Implementation Plan

To address the specific needs identified through data analysis and outlined previously in this document, Indiana has developed a plan which highlights two parallel paths for implementation in the coming years.

First, a subset of high-need schools will be identified to collaborate with IDOE to implement the Science of Reading. This model intends for active participation by the school to ensure success. IDOE will collaborate with both corporation and school leadership to select and assign a literacy coach to a building, interviewed and confirmed by IDOE staff. IDOE will pay for the associated salary and services of the assigned coach. The coach's primary duties will be training, oversight, modeling, and implementation of the Science of Reading practices. The coach's responsibilities will be governed by IDOE. The criteria used to select schools will be based on IREAD-3 and ILEARN performance data alongside the number of Good Cause Exemptions, and retest opportunity performance. Coaches will continually receive training and support over time, allowing calibration across sites within Indiana. The coaches are intended to serve as leaders in disseminating information at the local level. IDOE anticipates significant training for coaches, school administration, and school staff beginning in summer 2022.

Secondly, IDOE intends to offer the same opportunities to additional schools and corporations beginning in summer 2022. Corporations and schools outside of the high-need defined above may also opt-in as part of a voluntary coalition. Through this effort, minimum assurances and expectations will be defined for participation. Schools and corporations will be responsible for recruiting, funding, and overseeing implementation locally for this model. IDOE intends to provide collaboration and training opportunities at no cost for those utilizing the voluntary coalition. Participation in this model will be capped annually to ensure diligence and oversight of the implementation by IDOE and local participants.

Coaching Model

As noted above, IDOE intends to use a coaching model for implementation. In schools, the purpose of coaching is to provide consistent, job-embedded support to teachers based on research-based practices. IDOE will provide transformational coaching to help teachers make appropriate instructional changes that will improve student outcomes through the implementation of the Science of Reading. Research supports the effectiveness of coaching, and shows that at its foundation, it has resulted in an “increase [of] the instructional capacity of schools and teachers, a known prerequisite for increasing learning” (Neufeld & Roper, 2003). The increase in instructional capacity leading to increased learning is the ultimate goal of all schools. IDOE is excited to provide this support to Indiana schools that demonstrate the greatest need, with the long-term goal of building a model for all schools. Coaching, because of its emphasis on the involvement of educators as well as administrators and ongoing professional development, encourages program sustainability.

Research supports that the greatest benefit to coaching, as a form of professional development, is that the support is job-embedded and continuous (Darling-Hammond et al., 2017). When educators receive consistent and relevant support that can be used specific to the needs of their students and themselves, they have a greater likelihood of implementing new instructional practices or carrying out new initiatives with fidelity. Because Indiana's Priorities for Early Literacy is rooted in the importance of early literacy instruction's focus on the Science of Reading, it requires that teachers are well-trained, regularly-supported, and continuously-developed in this approach to reading instruction. This accessibility to support is the missing piece for the majority of educator professional development. Providing a coach in high-need schools will give teachers a common source of guidance and information that is necessary for them to seek improvement and change. It will also support and encourage a community of professionals continuing to learn from each other.

In addition to yielding results in student achievement, coaching provides high-quality professional development. In a study of student achievement before and after the implementation of a coaching model, “There was a significantly greater percentage of students scoring at proficiency and a significantly smaller percentage of students scoring at-risk in schools where coaches spent more time working with teachers” (Bean, 2010). These outcomes have been reflected in multiple states like Mississippi and Louisiana, which have also used coaching as the main strategy to improve student literacy achievement. Specifically, Neufeld and Roper (2003) outline the positive improvements resulting from implementing a coaching model:

- Translation of teacher development into classroom practice;
- A willingness among teachers to share their practice with one another and seek learning opportunities from peers and coaches as well as a willingness to assume collective responsibility for their students' learning;
- High-quality principal leadership of instructional improvement;
- Successful school cultures based on instruction being the focus of teacher and principal interaction; and
- Instructional advancement informed by achievement data.

Supporting Student Needs

Indiana data identifies specific student populations as areas of greatest need, most specifically students with disabilities and English learners. Current Indiana policy allows students to seek a Good Cause Exemption following the assessment of foundational reading skills through IREAD-3. This assessment policy allows for the Good Cause Exemption to be granted, followed by matriculation to the subsequent grade.

The implementation plan for Indiana must deliver training to coaches regarding thoughtful, continued support for student populations with tiered instruction.

Indiana policy intends to allow flexibility, but further evidence highlights the need for continued support. IDOE will offer guidance for coaches on:

- How to best support the needs of specific student populations;
- How to create or update individualized support plans for students;
- How to design and write appropriate goals; and
- How to monitor the progress of foundational reading skills over time.

After receiving a Good Cause Exemption, students with disabilities and English learners will need additional, focused reading instruction directed at those skill deficiencies revealed by the Individual Student Report. These documents, for [students with disabilities](#) and [English learners](#), walk educators and families through how to support students who qualify for the Good Cause Exemption.

Subsequently, the implementation plan relies on the collaboration of other content-area educators reinforcing key aspects of literacy, including research and comprehension in later grades. As such, Indiana's Priorities for Early Literacy includes interdisciplinary reading and support for educators in this area by identifying schools with the highest academic need and providing training in the Science of Reading.

Supporting students is an essential priority for this work. IDOE believes targeting efforts to those critically underserved allows the greatest impact to achieve success in this program.

Early Learning and Secondary Educators

Indiana's plan for support focuses on a coaching model and professional development for educators teaching kindergarten through grade two, but Indiana's Priorities for Early Literacy is designed to be comprehensive and includes support for students before and after those targeted years.

Infancy to age five programs should utilize an evidence-based curriculum that aligns with the Early Learning Foundations. Indiana intends to provide financial support to

identified schools, or community-based preschools that feed into identified schools, in the selection of curriculum to be utilized. In addition, infancy to age five educators are also encouraged to participate in professional development on the topic of early literacy as it relates to the developmental stages of the students they are serving. Finally, IDOE intends to support the use of a common assessment among identified schools.

Secondary educators must also have access to knowledge of evidence-based, instructional practices to support literacy through professional development, Professional Learning Communities, and other available resources. Additionally, Indiana must investigate and provide recommendations for support options to accelerate literacy growth in all students.

Once Indiana's Priorities for Early Literacy are fully implemented and sustained, higher student outcomes on summative assessments and college- and career-readiness benchmarks from pre-kindergarten through grade 12 will be evident. IDOE will partner with teacher education programs to include explicit instruction in the Science of Reading literacy practice and implementation to sustain progress in the future.

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