Pearson Clinical Assessment Solutions:

A Dyslexia Toolkit

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Pearson Clinical Assessment offers a dyslexia toolkit with resources for screening, identification, intervention, and progress monitoring. This report will be updated periodically as new tools become available.
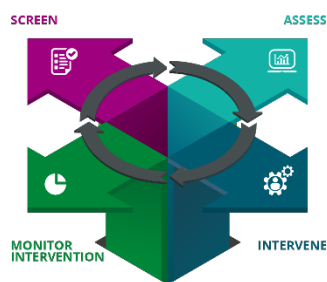
Up to 1 in 5 people exhibit symptoms of dyslexia, a common language-based learning disability[23]. Although developing and implementing an evidence-based assessment and intervention plan is crucial, very often the most important factor is early identification.

Pearson's dyslexia toolkit includes clinical and classroom resources for screening, diagnostic evaluations, intervention, and progress monitoring. Included are tools that can be used across a wide range of professional groups and user qualification levels.

Pearson's Dyslexia Toolkit

SCREEN	ASSESS	INTERVENE	MONITOR
aimsweb™Plus – includes the Shaywitz DyslexiaScreen™ and the Dyslexia Probability Calculator™	Wechsler Individual Achievement Test® (4th ed.; WIAT-4)	Intervention Guide for LD (Learning Disability) Subtypes	Growth Scale Values (GSVs)
Shaywitz DyslexiaScreen Forms 0–3, Adolescent-Adult, and Corrections	Process Assessment of the Learner™ (2nd ed.; PAL™–II): Diagnostics for Reading and Writing	Process Assessment of the Learner (PAL) intervention products	Progress Monitoring Assistant™
Dyslexia Probability Calculator	Kaufman Test of Educational Achievement™ (3rd ed.; KTEA™–3) Comprehensive Form	KTEA–3 teaching objectives and intervention statements & WIAT-4 intervention goal statements	Relative Performance Index (RPI) scores
Wide Range Achievement Test, (5th ed.; WRAT™5)	Woodcock Reading Mastery Tests™ (3rd ed.; WRMT™–III)	SPELL-Links™ to Reading & Writing™	aimswebPlus
Kaufman Test of Educational Achievement™ (3rd ed.; KTEA™–3) Brief Form	***Tests of intellectual functioning and oral language*** *are also included!.*	SPELL-Links Class Links for Classrooms™ SPELL-Links Wordtivities™	Review360®
Dyslexia index scores for the KTEA–3 and WIAT®-4			

When reviewing this white paper, please consider the following:

- Identifying individuals with dyslexia is a multistep, collaborative process. Supporting individuals who are academically at risk or individuals with dyslexia may require layers of effort from simple accommodations to special education intervention.

- Local processes and procedures across the United States (and globally) vary greatly within the dyslexia context. Consider tool choices, and each tool's appropriate use, carefully against the available scientific evidence and best practices in educational and clinical contexts.

Each resource in this toolkit shows strong empirical evidence on its own. The power of a toolkit comes from understanding the need for multiple tools and how they fit together to guide clear decision-making, giving the collective effort additional power. Clear data, a sufficient knowledge base, and team-based decision-making allow the best path forward.

Understanding Dyslexia

The International Dyslexia Association (IDA) established the following definition of dyslexia in 2002 and it has since been adopted by many U.S. federal and state agencies:

> 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 growth of vocabulary and background knowledge.[22]

In 2017, the U.S. Senate voted unanimously as part of the S. Res. 284[40] to establish the following definition of dyslexia, which was also included in the First Step Act of 2018[41]:

> (1) an unexpected difficulty in reading for an individual who has the intelligence to be a much better reader; and (2) most commonly caused by a difficulty in phonological processing (the appreciation of the individual sounds of spoken language), which affects the ability of an individual to speak, read, and spell, and often, the ability to learn a second language.[40, 41]

Both definitions refer to the unexpected nature of dyslexia that is often revealed by an uneven cognitive profile in which basic skill deficits are surrounded by a "sea of strengths" in areas such as reasoning, problem-solving, vocabulary, and listening comprehension.[43]

Dyslexia is a language-based reading and spelling disorder that typically results in lifelong impact to an individual. Dyslexia can be identified through medical or educational processes. Many professional and parent groups—including parents, school and clinical psychologists, speech-language pathologists, educational diagnosticians, reading specialists, general and special education teachers, school administrators, and government stakeholders—support individuals with dyslexia in a variety of ways. Collaboration among these groups is key to facilitating a productive, robust, evidence-based assessment and intervention plan.

A Multifactorial, Hybrid Model for Dyslexia Identification

Implementing an evidence-based process for dyslexia screening, identification, intervention, and progress monitoring is paramount to improving student outcomes. The tests and products recommended in this toolkit are designed to be used most effectively within a comprehensive framework for dyslexia identification. A growing body of research supports a multifactorial, hybrid model for dyslexia identification.

> **Multifactorial:** Not all individuals with dyslexia have the same underlying processing weaknesses; for this reason, approaches to identification that rely on a single criterion are prone to measurement error and show poor stability over time.[12, 13, 25, 26] A multifactorial approach considers phonological processing weaknesses as well as weaknesses in other areas including oral language, processing speed, and executive functions, and these risk factors are considered probabilistic, not deterministic.[12, 13]

> **Hybrid:** A hybrid model incorporates multiple sources of information including the degree to which the individual has responded to intervention.[49] Individuals who do not respond to high-quality instruction may be more likely to have an underlying cognitive deficit that manifests as dyslexia.

Figure 1 summarizes the symptoms, causes and correlates, and risk factors that may be considered as part of a dyslexia evaluation.

Figure 1. Multifactorial, Hybrid Model of Dyslexia Identification

Dyslexia

Symptoms	Causes/Correlates	Risk Factors
Poor response to intervention	• Phonological processing	• Family history
Pre-reader difficulties	• Rapid automatic naming	• Language impairment or poor receptive vocabulary
• Alphabet writing	• Auditory working memory	
• Phonics/letter knowledge	• Processing speed	
Reader difficulties	• Long-term storage and retrieval	
• Word reading/decoding	• Associative memory	
• Reading fluency	• Orthographic processing	
• Spelling		
• Written expression		
• Reading comprehension < Listening comprehension		

Symptoms

Before the onset of formal schooling, parents or caregivers may observe early risk factors for dyslexia. For example, some children with dyslexia begin speaking later than most other children, have problems with pronunciation, or use vague terms because they have difficulty recalling the specific word for an object.[43]

The symptoms of dyslexia are most commonly observed at school or during reading and writing tasks. Before learning to read, children with dyslexia may exhibit difficulties with alphabet writing, letter identification, and/or phonics (letter-sound correspondence).[4] After exposure to reading instruction, individuals with dyslexia may have difficulties with decoding pseudowords, word reading, reading fluency (oral reading fluency, in particular), spelling, and written expression. In addition, reading comprehension is relatively poor compared to listening comprehension among individuals with dyslexia.[49] However, when dyslexia and a developmental language disorder co-occur, poor decoding is compounded by language difficulties including weaknesses in both reading comprehension and listening comprehension.[48]

Poor response to high-quality instruction is considered an important symptom for identifying individuals with dyslexia because it indicates that the individual's difficulties cannot be attributed to lack of appropriate instruction.[49] However, poor intervention response is not sufficient on its own to reliably identify dyslexia because students may fail to respond to instruction for a number of other reasons such as intellectual disability and socioemotional problems. For this reason, collecting information about the examinee's educational history, including any accommodations, services, and specialized instruction received, is important for ruling out inadequate instruction as a primary cause of academic difficulty.

> An individual with dyslexia may not exhibit every symptom at a given point in time, and areas of weakness may change over time. To improve the stability of dyslexia identification and reduce the likelihood that a student will qualify one year and not the next, some researchers recommend a criterion of *n* or more (e.g., three or more or four or more) symptoms, including poor response to high-quality instruction as one of those symptoms.[49]

Evaluators are advised to assess other skill areas as well to identify additional areas of strength and weakness in the individual's learning profile. For example, assessing skill levels in the areas of math (computation, problem-solving, and fluency) is recommended because a subset of individuals with dyslexia experience math difficulties as well.[24] In addition, assessing vocabulary and grammar (morphological-syntactic) skills is important for understanding whether a developmental language disorder may be contributing to literacy difficulties.[4, 48]

Causes/Correlates

The causes and correlates of dyslexia include areas of cognitive processing weaknesses that are less easily observed than symptoms. The symptoms of dyslexia are typically either attributed to or related to weaknesses in one or more of the following areas: phonological processing (including phonological awareness and phonological coding), rapid automatic naming (the phonological loop of working memory), auditory verbal working memory, processing speed, long-term storage and retrieval, associative memory, and orthographicprocessing. Assessing the first three areas is considered paramount for a dyslexia evaluation according to the IDA guidelines.[24]

Although weaknesses in one or more aspects of phonological processing are often associated with dyslexia,[24] a single cognitive deficit cannot adequately explain the symptoms of dyslexia in all cases.[38] Rather, the causes of dyslexia are likely multiple, interacting, and probabilistic.[37] For this reason, a hypothesis-testing approach to assessment that explores multiple causes and correlates is helpful for understanding an individual's overall learning profile.

Risk Factors

Considering hereditary and correlated risk factors for dyslexia alongside behavioral symptoms supports a more robust model of dyslexia identification.[49] In addition to low scores on a dyslexia screening test, the risk factors for dyslexia involve aspects of an individual's family history and developmental history that are typically assessed through self- or parent report. Individuals with the following characteristics are at increased risk for dyslexia: a family history of dyslexia,[50] a history of language impairment, and/or weaknesses in receptive vocabulary.[47] Most individuals with dyslexia have at least age-appropriate receptive vocabulary and general language skills; however, vocabulary weaknesses may be seen in conjunction with a developmental language disorder or as a correlate of dyslexia if individuals spend less time engaged in reading and language activities.[16, 24, 47]

Strengths and Promotive Factors

Many individuals with dyslexia exhibit relative strengths in areas such as **fluid reasoning and problem-solving**, **oral language** (including listening, speaking, vocabulary, and grammar), and **math.**[43] **Verbal comprehension and reasoning** tends to be intact and discrepant from measures of word reading and spelling for individuals with dyslexia.[4] Utilizing an individual's areas of strengths for remediating weaknesses can contribute to an effective intervention approach.[39]

Promotive factors improve reading outcomes for all individuals and foster resilience for individuals with risk factors; strong performance on promotive factors are associated with stronger reading skills.[46] Promotive factors include **verbal/oral language skills, rapid automatic naming, verbal working memory,** and **processing speed.**[46]

Pearson Dyslexia Toolkit

Screen   Assess   Intervene   Monitor
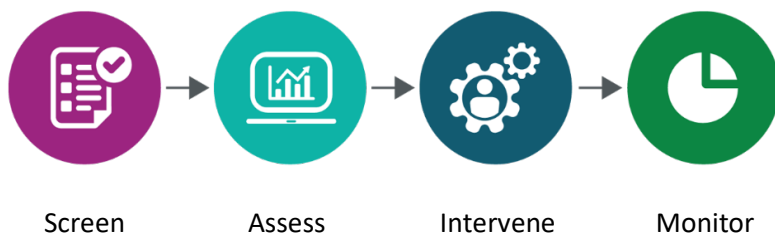
The Pearson dyslexia toolkit includes clinical assessments and resources for screening, diagnostic evaluations, intervention, and progress monitoring. To assist the varied groups of professionals who support individuals with dyslexia, this toolkit includes tools used across professional groups and user qualification levels.

Screening Tools

Screening tests do not diagnose a condition. Rather, individuals who show risk on a screening test typically require further evaluation and/or early intervention.

The Pearson toolkit for dyslexia screening includes the following measures:

- Shaywitz DyslexiaScreen – included in aimswebPlus, Review360, and Q-global®
- Dyslexia Probability Calculator – included in aimswebPlus
- Wide Range Achievement Test (5th ed.; WRAT5)
- Kaufman Test of Educational Achievement (3rd ed.; KTEA–3) Brief Form
- Dyslexia Index, composite scores developed for the KTEA–3 Comprehensive Form and the Wechsler Individual Achievement Test (4th ed.; WIAT-4)

The **Shaywitz DyslexiaScreen**[44] is a brief screener for identifying individuals at risk for dyslexia. This assessment can be used for targeted or universal screenings. Forms 0–3 (for Grades K–3) are teacher surveys that can be completed by a teacher in less than 5 minutes using an online form. Digital administration and scoring using Q-global, Review360, or aimswebPlus provides evaluators with immediate results and reporting capabilities for individuals and groups of students. The Adolescent-Adult Form and the Corrections Form are self-report surveys for individuals ages 14–65 in the general population and ages 18–68 in corrections settings, respectively. The classification accuracy data indicate moderately high sensitivity and specificity for all forms. The Shaywitz DyslexiaScreen correctly classified 71% of kindergarten students, 85% of first-grade students, 80% of second-grade students, 85% of third-grade students, 94% of adolescents and adults, and 96% of incarcerated individuals.[45]

The **Dyslexia Probability Calculator**[6] currently delivered using aimswebPlus, considers the impact of family history for dyslexia and helps educators triage students according to risk levels. The Calculator provides a probability of dyslexia that estimates the likelihood that a student has dyslexia based on the following four factors: (1) the results of the Shaywitz DyslexiaScreen, (2) the psychometric properties of the Shaywitz DyslexiaScreen (how accurately it classifies students with and without dyslexia), (3) whether the student has a family history of dyslexia (if this information is available), and (4) the prevalence rate of dyslexia in the population. The results are interpreted categorically as low, moderate, or high probability of dyslexia which can inform the intensity of the intervention.

The **WRAT5**[58] is a widely used screening test of reading, spelling, and math skills in individuals ages 5–85+ years (Grades K–12+). This test includes four subtests (Word Reading, Sentence Comprehension, Spelling, and Math Computation) and one Reading composite that all can be administered in about 20–30 minutes. Examiners have the flexibility to administer a single subtest or any combination of the four subtests. Clinical validity data indicate that students with dyslexia/reading disorder performed significantly lower than the matched control group on all subtests except Math Computation with large effect sizes observed.

The **KTEA–3 Brief Form**[28] is used to screen for weaknesses in reading, writing, and mathematics and to obtain a general estimate of academic achievement for Grades PK–12+ (ages 4–25). The three-subtest Brief Achievement (BA-3) composite for Grades K–12+, which includes measures of word reading, spelling, and math computation, is especially useful for this purpose. Results may be used to identify examinees who would benefit from a comprehensive evaluation. To obtain more complete information across all three academic areas, three additional subtests are administered and the scores are combined with the three subtest scores from the BA-3 to yield the Academic Skills Battery (ASB) composite. The subtests used in the ASB also provide domain composites in Reading, Math, and Written Language. If the results from the ASB or domain composites suggest the need for further testing, administration of the KTEA–3 Comprehensive Form is recommended. The Comprehensive Form includes supplemental subtests that are useful for exploring specific aspects of academic functioning. All standard scores from subtests administered using the Brief Form can be applied to either Form A or Form B of the KTEA–3 Comprehensive.

The **KTEA–3 and WIAT-4 Dyslexia Index**[7, 10] scores were designed to provide theoretically sound, reliable, and clinically sensitive composite scores for identifying risk for dyslexia among children, adolescents, and adults. In 15 minutes or less, practitioners can obtain a Dyslexia Index score to screen for dyslexia and identify individuals who may benefit from a comprehensive evaluation or a more intensive intervention approach. A single score, such as the Dyslexia Index, is not sufficient to diagnose dyslexia. Rather, a diagnosis of dyslexia is based on a convergence of evidence gathered from multiple sources. However, the Dyslexia Index results may contribute to a more in-depth evaluation.

As shown in Table 1, the subtests included in the KTEA–3 Dyslexia Index differ for Grades K–1 and 2–12+, and in the WIAT-4 Dyslexia Index the subtests differ for Grades PK–3 and 4–12+. The composite structures were based on clinical data with a strong empirical foundation. The results provide a standard score that corresponds to one of six categories of risk for dyslexia ranging from very low to very high.

The Dyslexia Index scores are available in Q-interactive® or by purchasing the KTEA–3 or WIAT-4 Dyslexia Index kit. For WIAT-4 users, the Dyslexia Index is included as part of the test.

Table 1 summarizes the reliability coefficients, clinical validity data, and administration time for the dyslexia screening measures. The Area Under the Curve (AUC) estimates for the dyslexia screening tools range from .81 to .95 indicating that the screeners have good-to-excellent accuracy in distinguishing individuals at risk for dyslexia from those not at risk.

Reliability refers to the accuracy, consistency, and stability of test scores across situations. Reliability coefficients ≥ .90 are considered excellent; .80–.89 are good.

Effect size refers to the magnitude of the difference in test performance between the reading disorder/dyslexia group and the control group. Large effect sizes are ≥ .80.

AUC is a combined measure of sensitivity and specificity and the industry standard criterion for evaluating the quality of a screening instrument. Values ≥ .90 are excellent; ≥ .80 are good.

Table 1. Technical Characteristics of Dyslexia Screening Measures

Test or index score	Grade/age	Item/subtest	Mean reliability	Effect size	AUC	Admin. time (min.)
Shaywitz DyslexiaScreen: Form 0	Kindergarten	10 items	.87	1.48	.81	< 5
Shaywitz DyslexiaScreen: Form 1	1	12 items	.90	1.78	.89	< 5
Shaywitz DyslexiaScreen: Form 2	2	10 items	.94	2.06	.92	< 5
Shaywitz DyslexiaScreen: Form 3	3	10 items	.95	2.38	.94	< 5
Shaywitz DyslexiaScreen: Adolescent-Adult Form	Ages 14–65	10 items	.86	2.55	.95	< 5
Shaywitz DyslexiaScreen: Corrections Form	Ages 18–68	10 items	.86	2.47	.95	< 5
WRAT5 Reading composite	1–12+ Ages 6–89+	Word Reading + Sentence Comprehension	.96	1.70	.89	10–20
KTEA–3 Brief: BA-3 composite	K–12+ Ages 5–25	Letter & Word Recognition+ Spelling + Math Computation	.98	2.11	.93	20
KTEA–3 Dyslexia Index: Grades K–1	K–1 Ages 5–7	Phonological Processing + Letter Naming Facility + Letter & Word Recognition	.92	1.79	.90	18–20
KTEA–3 Dyslexia Index: Grades 2–12+	2–12+ Ages 7–25	Word Recognition Fluency + Nonsense Word Decoding + Spelling	.97	1.76	.89	12–15
WIAT-4 Dyslexia Index: Grades PK–3	PK–3 Ages 4–9	Phonemic Proficiency + Word Reading	.98	2.11	.95	20
WIAT-4 Dyslexia Index: Grades 4–12+	4–12+ Ages 9–50	Word Reading + Orthographic Fluency +Pseudoword Decoding	.98	2.05	.92	5

Note. Data for KTEA–3, WIAT-4, and WRAT5 were derived from age-based standard scores. Alpha reliability is reported for the Shaywitz DyslexiaScreen forms; split half reliability is reported for all other tests. All scores from the dyslexia groups were significantly ($p < .01$) lower than those of the nonclinical matched control groups. Clinical *n*-counts for the KTEA–3 Dyslexia Index at Grades K–1 were insufficient (< 20) for group comparisons; for this reason, group means, effect sizes, and AUC estimates were based on samples of students in Grades 1–4. The clinical sample for the WIAT-4 Dyslexia Index at Grades PK–3 included students in Grades 1–3.

Literacy Screener vs. Dyslexia Screener

Test developers must provide data that support the use of a test for each intended use (Standard 12.2).[1] Data that support the use of a test as a dyslexia screener include AUC, sensitivity/specificity, and clinical effect size. A test that *only* provides validity evidence for predicting or estimating reading skills is a reading screener. Reading tests vary in how well they detect risk for dyslexia. As part of a dyslexia screening process, individuals who perform poorly on a literacy/reading screener should also be given an empirically validated dyslexia screening test.

Diagnostic Assessment Tools

The diagnostic process for specific learning disability (SLD) identification or a dyslexia evaluation typically involves three steps: [4]

Step 1: Rule out other potential causes of learning difficulties including pervasive or specific developmental disabilities, intellectual disability or borderline intellectual functioning, vision or hearing difficulties, socioemotional or cultural/linguistic factors, etc.

Step 2: Assess learning profiles for specific learning disabilities and assess for common comorbid conditions

Step 3: Make a differential diagnosis

To support this process, the Pearson dyslexia toolkit includes assessments of academic achievement, intellectual functioning, and oral language.

Assessment of Academic Achievement

The Pearson dyslexia toolkit includes four academic achievement-related tests:

- Kaufman Test of Educational Achievement (3rd ed.; KTEA–3) Comprehensive Form

- Process Assessment of the Learner (2nd ed.; PAL–II): Diagnostics for Reading and Writing

- Wechsler Individual Achievement Test (4th ed.; WIAT-4)

- Woodcock Reading Mastery Tests (3rd ed.; WRMT–III)

Table 2 summarizes the key features of the academic achievement assessment tools.

Table 2. Key Features of Academic Achievement Assessments

Test	Publication	Grade/age	Form	Admin./scoring options
KTEA–3 Comprehensive Form	2014	PK–12 Ages 4–25	2 parallel forms	• Hand score • Q-global • Q-interactive
PAL–II Reading and Writing	2007	K–6	1 form	Hand score
WIAT-4	2020	PK–12 Ages 4–50	1 form	• Hand score • Q-global • Q-interactive
WRMT–III	2011	K–12 Ages 4–79	2 parallel forms	• Hand score • Q-global

The **KTEA–3 Comprehensive Form**[27] is designed to provide information about normative and personal strengths and weaknesses in reading, writing, math, oral language, and key processing areas relevant to dyslexia. The KTEA–3 assessment information may be used to make eligibility, placement, and diagnostic decisions; plan intervention; and monitor progress over time. The clinical validity data[29] indicate that, with the exception of Associational Fluency, all subtest and composite scores for the dyslexia (SLD-reading/writing) group were significantly ($p < .01$) lower than those of the matched control group with large effect sizes. Although the dyslexia group scored significantly lower than the control group across nearly every academic measure, mean scores for the dyslexia group were lowest (below 85) on the reading, reading-related, and spelling subtests.

The **PAL–II Reading and Writing**[3] is designed to measure reading- and writing-related processes to facilitate the differential diagnosis of dyslexia, dysgraphia, and oral and written language learning disability (OWL-LD) and to link assessment results with interventions. The PAL–II, which is often used to complement an evaluation that includes the KTEA–3, WIAT-4, or WRMT–III, is ideal for pinpointing why a student struggles in reading and/or writing.

The **WIAT-4**[36] provides information about normative strengths and weaknesses in reading, math, written expression, and oral language. Results obtained from the WIAT-4 can be used to inform decisions regarding eligibility for educational services, educational placement, or a diagnosis of a specific learning disability, and the results include suggestions for instructional objectives and interventions. According to the clinical validity data[9] for the dyslexia (SLD-reading) group, all subtest and composite scores, with the exception of Essay Composition, were significantly ($p < .01$) lower than those of the matched control group. Large effect sizes were observed for all reading and reading-related subtests. The largest effect sizes were for the Reading, Basic Reading, Decoding, and Dyslexia Index composites. Relative strengths were observed on math and oral language subtests that showed mostly moderate effect sizes.

The **WRMT–III**[60] provides a comprehensive battery of tests that measure reading readiness and reading achievement for the purpose of developing tailored intervention programs. According to the clinical validity data,[61] the mean scores for the dyslexia group were significantly ($p < .01$) lower than those of the matched control group for all scores except Rapid Automatic Naming: Number and Letter Naming. All effect sizes were large except those for Listening Comprehension and Rapid Automatic Naming: Number and Letter Naming which were moderate.

> **Table 3** lists the key skill areas recommended for dyslexia assessment by the IDA,[24] as well as secondary areas that are important to consider, and the relevant measures provided by the KTEA–3, PAL–II, WIAT-4, and WRMT–III. The measures listed include subtests and subtest component scores.

Table 3. Content Coverage of Academic Achievement Assessments

Key area for dyslexia assessment	KTEA–3	PAL–II	WIAT-4	WRMT–III
Phonics skills/letter knowledge	• Letter & Word Recognition • Letter Naming Facility • Letter Checklist	• Letters	• Word Reading (early items)	• Letter Identification
Decoding pseudowords	• Nonsense Word Decoding	• Pseudoword Decoding	• Pseudoword Decoding	• Word Attack
Word reading	• Letter & Word Recognition		• Word Reading	• Word Identification
Reading fluency	• Word Recognition Fluency • Decoding Fluency • Silent Reading Fluency	• RAN-Words • Morphological Decoding Fluency • Sentence Sense	• Oral Reading Fluency • Decoding Fluency • Orthographic Fluency	• Oral Reading Fluency
Spelling	• Spelling	• Word Choice	• Spelling	
Written expression	• Written Expression • Writing Fluency	• Sentences: Writing • Compositional Fluency • Expository Note Taking and Report Writing	• Sentence Composition • Essay Composition • Writing Fluency	
Receptive vocabulary	• Reading Vocabulary	• Are They Related?	• Listening Comprehension: Receptive Vocabulary	• Word Comprehension
Rapid naming	• Object Naming Facility • Letter Naming Facility	• RAN-Letters • RAN-Letter Groups		• Rapid Automatic Naming
Phonological awareness	• Phonological Processing	• Rhyming • Syllables • Phonemes • Rimes	• Phonemic Proficiency	• Phonological Awareness
Auditory working memory (phonological memory)	• Phonological Processing	• Sentences: Listening • Letters • Words	• Oral Expression: Sentence Repetition	
Secondary area				
Reading comprehension	• Reading Comprehension	• Sentence Sense	• Reading Comprehension	• Passage Comprehension
Listening comprehension	• Listening Comprehension	• Sentences: Listening	• Listening Comprehension: Oral Discourse Comprehension	• Listening Comprehension
Orthographic processing	• Orthographic Processing composite	• Receptive Coding • Expressive Coding • Word Choice	• Orthographic Fluency • Orthographic Choice (Q-interactive only) • Orthographic Processing composite	
Grammatical ability	• Oral Expression	• Does it Fit? • Sentence Structure	• Oral Expression • Sentence Composition	

Assessment of Intellectual Functioning

The Pearson toolkit for dyslexia evaluations also includes tests of intellectual functioning. Within the context of a dyslexia evaluation, tests of intellectual functioning are used for the following purposes:

- To assess individuals with complicated learning profiles, such as gifted students with dyslexia, and better understand their unique learning profile and needs[24]

- To facilitate the differential diagnosis of dyslexia, developmental disability, intellectual disability/borderline intellectual functioning, and a language disorder, which involves the assessment of overall cognitive ability, verbal reasoning, and nonverbal reasoning[2, 4, 42]

- To identify dyslexia using a pattern of strengths and weaknesses (PSW) approach, whereby individuals with dyslexia show consistency between areas of cognitive processing weakness and academic weakness coupled with a significant discrepancy between areas of cognitive processing strength and cognitive processing weakness or by using an ability-achievement discrepancy (AAD) approach[19, 20]

- To develop individualized approaches to intervention that consider areas of processing weakness as well as strength[32]

The Pearson dyslexia toolkit includes several tests of intellectual functioning for practitioners with varying qualification levels (qualification criteria are provided at pearsonassessments.com):

Qualification Level C

- Differential Ability Scales™ (2nd ed.; DAS™–II)[15]

- Kaufman Assessment Battery for Children (2nd ed.) Normative Update (KABC™–II NU)[30]

- NEPSY® (2nd ed.; NEPSY–II)[33]

- Wechsler Adult Intelligence Scale® (4th ed.; WAIS®–IV)[51]

- Wechsler Intelligence Scale for Children® (5th ed.; WISC®–V)[53]

- Wechsler Preschool and Primary Scale of Intelligence® (4th ed.; WPPSI®–IV)[52]

- Wechsler Nonverbal Scale of Ability (WNV®)[55]

Qualification Level B

- Kaufman Brief Intelligence Test™ (2nd ed.) Revised (KBIT™-2 Revised; expected 2022)[31]

The WISC–V is one of the most commonly used school-age tests of intellectual functioning. The WISC–V is linked with the WIAT-4 and the KTEA–3, and it includes measures that differentiate individuals with dyslexia (SLD-Reading) from matched controls. The clinical validity data[54] indicate significant difficulties among the dyslexia group with immediate paired associate learning, naming speed, verbal comprehension, and working memory. The mean scores for the dyslexia group were significantly ($p < .05$) lower than those of the matched control group for all index scores, with largest effect sizes observed for the Working Memory Index (WMI) and the Verbal Comprehension Index (VCI). All global, ancillary, and complementary composites were significantly lower ($p < .05$) and showed large effects as well. Several of the ancillary and complementary composites correspond to the previously discussed causes/correlates of dyslexia.

Table 4 summarizes the key cognitive processing areas measured by the WISC–V that may be impaired for individuals with dyslexia or that may be a relative strength/promotive factor.

Table 4. WISC–V Measures of Key Cognitive Processing Areas for a Dyslexia Evaluation

Cognitive processing area	WISC–V index score
Auditory working memory (phonological memory)	Auditory Working Memory Index (AWMI)
Rapid automatic naming	Naming Speed Index (NSI)
Verbal comprehension and reasoning	Verbal Comprehension Index (VCI)
Processing speed	Processing Speed Index (PSI)
Long-term storage and retrieval	Storage and Retrieval Index (SRI)
Associative memory (learning efficiency)	Symbol Translation Index (STI)
Fluid reasoning	Fluid Reasoning Index (FRI)

New for 2022: The KBIT-2 Revised provides information about verbal and nonverbal intellectual functioning in about 20 minutes, and it can be administered by a wide range of qualified professionals with training in assessment. Table 5 summarizes the key cognitive processing areas measured by the KBIT-2 Revised in the context of a dyslexia evaluation.

Table 5. KBIT-2 Revised Measures of Key Cognitive Processing Areas for a Dyslexia Evaluation

Cognitive processing area	KBIT-2 Revised measure
Verbal comprehension and reasoning	Verbal score (Verbal Knowledge, Riddles subtests)
Fluid reasoning	Nonverbal score (Matrices subtest)

Table 6 summarizes the cognitive ability linking studies available for the KTEA–3 and the WIAT-4. A linking study is conducted by administering a diagnostic achievement test and a test of intellectual functioning/cognitive ability to the same group of examinees for the purpose of understanding relations between their scores. These studies provide the necessary data for conducting a pattern of strengths and weaknesses (PSW) analysis or an ability-achievement discrepancy (AAD) for the identification of a specific learning disability such as dyslexia.

Table 6. Cognitive Ability Linking Studies

Cognitive ability test	KTEA–3	WIAT-4
WISC–V	•	•
DAS–II	•	•
KABC–II NU	•	
WNV		•
KBIT-2 Revised	•	

Assessment of Oral Language

The Pearson toolkit for dyslexia diagnostic evaluations also includes tests of oral language. Within the context of a dyslexia evaluation, tests of oral language are used for the following purposes:

- To establish oral language skills as either a promotive factor or a risk factor in dyslexia screening[46]

- To facilitate the differential diagnosis of dyslexia, developmental disability, developmental language disorder (DLD), or oral and written language learning disability (OWL-LD)[2, 4]

- To develop individualized approaches to intervention that consider areas of oral language weakness and strength[2, 4]

The Pearson dyslexia toolkit includes the following tests of oral language:

- Clinical Evaluation of Language Fundamentals® (5th ed.; CELF®–5)[56]

- Auditory Skills Assessment (ASA™)[17]

- Peabody Picture Vocabulary Test™ (5th ed.; PPVT™–5)[14]

- Expressive Vocabulary Test (3rd ed.; EVT™–3)[59]

Of these measures, the CELF–5 provides the most comprehensive battery of tests for language assessment including measures of oral language and written language (i.e., reading, writing). The CELF–5 is designed primarily to identify and provide follow-up evaluations for individuals with language and communication disorders. Table 7 lists the CELF–5 measures that may be used to assess some of the key skill areas recommended for dyslexia evaluations by the IDA[24] as well as secondary areas that are important to consider. Results support the development of an Individualized Education Program (IEP) that considers communication needs and for planning interventions in accordance with the Individuals with Disabilities Education Improvement Act (IDEA) of 2004.[21]

> According to the CELF–5 clinical validity data,[57] students diagnosed with a learning disability in reading and/or writing scored significantly lower on all tests and composites except for the Sentence Comprehension test compared to students with typical language skills. Score differences for all tests except the Pragmatics Profile showed medium to large effect sizes.

Pearson tests of oral language may contribute to an interdisciplinary dyslexia evaluation process. The use of these tools by a speech-language pathologist or similarly trained professional may support team decision-making in a differential diagnosis, a profile of strengths and weaknesses, and intervention planning.

Table 7. CELF–5 Measures of Key Language Areas for a Dyslexia Evaluation

Language area	CELF–5
Auditory verbal working memory (phonological memory)	Recalling Sentences
Receptive vocabulary	Linguistic Concepts Word Classes Word Definitions
Written expression	Structured Writing
Listening comprehension	Following Directions Semantic Relationships Sentence Comprehension Understanding Spoken Paragraphs
Reading comprehension	Reading Comprehension
Grammatical ability	Formulated Sentences Recalling Sentences Sentence Assembly Word Structure

Intervention Tools

The Pearson dyslexia toolkit includes the following intervention resources:

- Intervention Guide for Learning Disability (LD) Subtypes

- SPELL-Links to Reading & Writing,[34] SPELL-Links Class Links for Classrooms,[35] and, SPELL-Links Wordtivities

- Process Assessment of the Learner (PAL) Intervention Materials: Guides for Intervention—Revised, Research-Based Reading and Writing Lessons—Revised, Handwriting Lessons—Revised, and Talking Letters—Revised

- KTEA–3 teaching objectives and intervention statements

- WIAT-4 intervention goal statements

The **Intervention Guide for LD Subtypes**[8] accessible through Q-global, compares an examinee's skill level profile with the theoretical profiles of various types of reading difficulties (including dyslexia) with a phonological core deficit and readers with poor language comprehension. The report provides tailored, research-supported intervention suggestions. Examinees may benefit from the interventions provided in the report regardless of whether they have been identified or diagnosed with dyslexia. Information about the examinee's cognitive processing, language, and achievement skills may be obtained from assessments in Q-global; however, other test results as well as qualitative data are also considered.

SPELL-Links to Reading & Writing,[34] **SPELL-Links Class Links for Classrooms,**[35] and **SPELL-Links Wordtivities** (see PearsonAssessments.com) use a speech-to-print word study approach that leverages the brain's innate, biological wiring and organization for oral language. Students first learn how to attend to the sound structure of spoken English words and then how to connect and combine sounds (phonology), letter patterns (orthography), and meanings (semantics, morphology) to read and spell words.

> **SPELL-Links to Reading & Writing** is a word study curriculum for Grades K–12 that delivers all components of assessment and instruction identified by the U.S. Department of Education-funded Center on Instruction as crucial for developing reading and spelling skills in every student. This program is appropriate for Tier 1, 2, and 3 students as well as students receiving services for dyslexia/special education, speech/language impairment, English language learners, or Title I.

> **SPELL-Links Class Links,** based on SPELL-Links to Reading & Writing, provides everything needed to deliver a year of high-quality Tier 1/Tier 2 classroom instruction for kindergarten and early Grade 1 to meet educational development standards for spelling, word decoding, reading fluency, vocabulary, reading comprehension, and writing. The curriculum includes quick and easy lesson plans for word study to improve reading and writing success and downloadable mini-books that help students apply taught skills.

> **SPELL-Links Wordtivities** features a variety of engaging activities and materials for use with whole class, small group, and 1:1 instruction for Grades K–12. Students will improve spelling; build depth and breadth of vocabulary; advance word decoding, reading fluency, and reading comprehension; and enhance writing performance. It can be used as a stand-alone word study program within an existing language-arts curriculum or in conjunction with SPELL-Links to Reading & Writing.

The **PAL Intervention Materials**[5] include a series of resources for reading and writing including handwriting. The PAL Intervention materials can be accessed via Mimeo: https://marketplace.mimeo.com/pearsonPAL

> **Guides for Intervention—Revised** highlights conceptual foundations of reading, writing, and assessment-to-intervention links and the underlying research. Following these foundations, Part II outlines a step-by-step, detailed approach to designing intervention plans with 10 case examples.

> **Research-Based Reading and Writing Lessons—Revised** includes an instructional manual and a second volume of reproducible materials. Fifteen lesson sets include five sets for Tier 1/early intervention, five sets for Tier 2/curriculum modification, and five sets for Tier 3/tutorials for dyslexia and dysgraphia.

> **Handwriting Lessons—Revised** encompasses two sets of 24 lessons, several of which are used in connection with the Reading and Writing Lessons. Each set presents all 26 letters of the English alphabet in two different writing styles.

> **Talking Letters—Revised** focuses on spelling-sound and sound-spelling correspondences as well as the alphabetic principle. Student teaching materials for consonants and vowels organized by syllable type are included.

The **KTEA–3 score reports** in Q-global and Q-interactive include customizable teaching objectives and intervention suggestions based on error analysis results.

- Example of a teaching objective for an error norm weakness in the Silent Letter category for the Letter & Word Recognition subtest: Given a list of ___ words containing silent letters as part of the sound pattern, the student will pronounce each word with no more than ____ silent letter errors.

- Example of an intervention suggestion for errors made on the Letter & Word Recognition subtest: Scavenger Hunt—Ask the student to look in the lesson book to find examples of words that begin with, end with, or contain a particular sound.

The **WIAT-4 score reports** in Q-global and Q-interactive provide customizable intervention goal statements based on skills analysis results. These statements include instructional recommendations for writing annual goals and short-term objectives based upon the results of the skills analysis or, for subtests without skills analysis, overall subtest performance.

- Example of an intervention goal statement for the category of Schwa Vowel Sounds for the Word Reading subtest: Given a list of __ (circle/enter: one, two, three, __) -syllable words containing schwa vowel sounds, the student will read the list aloud with no more than __ schwa vowel errors. Schwa vowel sounds will include (circle): a, e, i, o, u, y.

- Schwa vowel (a) examples: above, alone, disappoint

Progress Monitoring Tools

The Pearson dyslexia toolkit for progress monitoring includes the following tools:

- Growth Scale Values (GSVs) and Progress Monitoring Assistant (PMA)

- Relative Performance Index (RPI) scores

- aimswebPlus

- Review360

> GSVs and RPI scores within diagnostic achievement tests are designed to measure growth over extended periods of time, such as annually.
>
> AimswebPlus and Review360 progress monitoring measures are designed to be sensitive to growth over shorter periods of time.

Growth scale values (GSVs) are preferred over standard scores and percentile ranks for measuring growth because GSVs reflect the examinee's absolute (rather than relative) level of performance. GSVs are useful for comparing an examinee's performance on a particular subtest or composite relative to their own past performance, whereas standard scores and percentile ranks are useful for comparing performance relative to peers. For tests with two forms, GSVs obtained on one form are directly comparable to GSVs obtained on the other form. A significant change in GSV scores indicates that the examinee has demonstrated significant progress. GSVs are provided for the WIAT-4, KTEA–3, WRAT5, CELF–5, PPVT–5, and EVT–3. However, GSVs are not comparable across tests or subtests.

A **Progress Monitoring Assistant**[11] software application is provided for the WIAT-4, PPVT–5, and EVT–3 that analyzes changes in an examinee's GSVs and standard scores over time. An example of an interpretive statement that might be provided: *These results suggest that the student's decoding skills improved relative to personal performance but at a similar rate relative to peers*.

Relative Performance Index (RPI) scores, provided on the WRMT–III, are designed to translate a normative score into task performance terms. The RPI is expressed as a quotient: the numerator is the examinee's probability of success on the target items and the denominator is the probability of success of the average individual in the reference group—which is always 90%. An RPI of 70/90, for example, indicates that the examinee will perform with 70% accuracy on items that the average individual in the same grade or age performs with 90% accuracy. RPI scores describe the probability of successfully performing a task, not relative standing in a group. Changes in RPI scores over time can be used to measure progress if the educational team establishes criteria for sufficient growth based on RPI scores.

aimswebPlus progress monitoring measures are designed to be sensitive to growth over relatively short periods of time. Depending on the intensity of the intervention and other factors, progress can be monitored as often as once a week. aimswebPlus offers enhanced screening and progress monitoring measures for Grades K–8. In addition to curriculum-based measurement (CBM) measures, aimswebPlus standards-based assessments provide information about a student's reading skills to help teachers develop individualized and effective interventions. The Early Literacy measures are intended for Grades K–1 and include Print Concepts, Letter Naming Fluency, Initial Sounds, Auditory Vocabulary, Letter Word Sounds Fluency, Phoneme Segmentation, Word Reading Fluency, and Oral Reading Fluency. The Reading assessment system developed for Grades 2–8 includes Vocabulary, Reading Comprehension, Silent Reading Fluency, and Oral Reading Fluency measures.

Review360 provides several dyslexia-related progress monitoring plans within the application. The *Academic Progress Plan, Speech-Language Pathology, and Student Support Team* plans allow detailed progress monitoring for general and special education settings.

Interpreting Assessment Data

Table 8 provides a sample summary of dyslexia assessment data for each of the indicators included in the multifactorial, hybrid model for dyslexia identification. For best results, cross-validate assessment data across multiple sources of information, consider exclusionary factors, and assess for common comorbid conditions.

Table 8. Sample Summary of Dyslexia Assessment Data

	Skill/ability/indicator	IDA key indicator[a]	Test/ source	Low/ below average	Average	High/ above average	At risk (Y)/ not at risk (N)	N/A or not observed
Symptoms of difficulty	Intervention response[b]							
	Alphabet writing							
	Letter knowledge and phonics	✓						
	Decoding pseudowords	✓						
	Word reading	✓						
	Reading fluency	✓						
	Spelling	✓						
	Written expression	✓						
	Reading comprehension							
	Listening comprehension[c]							
Causes/correlates	Phonological processing	✓						
	Rapid automatic naming	✓						
	Auditory verbal working memory	✓						
	Processing speed							
	Long-term storage and retrieval							
	Associative memory							
	Orthographic processing							
Risk factors	Dyslexia screening results							
	Family history							
	History of language impairment							
	Receptive vocabulary[d]	✓						
Possible strengths	Fluid reasoning							
	Oral language; verbal comprehension							
	Math skills							

[a] The key skill areas recommended for dyslexia assessment by the International Dyslexia Association.[24]

[b] Including poor response to instruction and *n* or more symptoms as inclusionary criteria may improve the stability of dyslexia identification over time.

[c] Greater impairment in reading comprehension relative to listening comprehension is a symptom of dyslexia when there is not a co-occurring developmental language disorder.

[d] Receptive vocabulary may be either a risk factor for dyslexia at a young age when associated with a language impairment, a correlate among older individuals with dyslexia who read less than their peers, or a relative strength for individuals with dyslexia.

How the Pearson Dyslexia Toolkit Works: Two Scenarios

School-based processes and procedures for dyslexia identification vary widely. The following two scenarios exemplify how different school systems may implement the dyslexia toolkit.

Scenario 1

A school district implements a universal screening process whereby all students, starting in kindergarten, are screened for dyslexia using the Shaywitz DyslexiaScreen. Those students who are identified as at risk are given a follow-up behavioral screener, using the WIAT-4 Dyslexia Index score.

Following this two-step screening process, the student support team meets to determine next steps. Students at risk are given supplemental instruction using the SPELL-Links Wordtivities word study program for 9–12 weeks.

To monitor academic progress, curriculum-based measures are administered weekly, and the KTEA–3 subtests from the Dyslexia Index score are readministered using the alternate form every 3–4 months. The subtest growth scale values (GSVs) are charted and compared over time to determine if significant progress has been observed.

Underperforming students are referred for a comprehensive evaluation that includes cognitive, language, and achievement measures. The student support team considers these test results and other sources of information, such as school grades/test scores, classroom observation, teacher reports, and parent/caregiver interviews (family history/background information), to determine what services a student is qualified to receive and how best to improve the student's performance.

Scenario 2

A school district administers aimswebPlus to all students as a benchmark screener. Students with low performance on the reading benchmark are further screened using the Shaywitz DyslexiaScreen.

Students identified as at risk based on these measures are administered three subtests from the KTEA–3 Brief Form to obtain the BA-3 composite score. Based on these results, the child study team meets to determine next steps. The PAL Reading and Writing Lessons–Revised and the Talking Letters–Revised are utilized for intervention.

aimswebPlus is used to monitor progress and the team continually evaluates the progress monitoring data to determine if instructional adjustments are needed.

The child study team refers students for a special education evaluation based on insufficient response to instruction. The special education assessment process includes assessments from multiple disciplines including language, achievement, ability, and cognitive areas. The child study team considers these test results and other sources of information to determine what services a student is qualified to receive and how best to improve the student's performance.

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