Benchmarks and Composite Score

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Acadience Reading Pre-K: PELI (PELI) provides three types of scores at each benchmark assessment period: (a) a raw score for each subtest, (b) a Language Index, and (c) the overall PELI Composite Score. Each of the scores is interpreted relative to the benchmarks and cut points for risk at each benchmark assessment period to determine if a child's score is at or above the benchmark, below the benchmark, or below the cut point for risk (well below the benchmark).

Benchmarks and Cut Points for Risk

PELI *benchmarks* are empirically derived, criterion-referenced target scores that represent adequate emergent literacy skills for preschool age children. Benchmarks and cut points for risk are provided for the PELI Composite Score, the PELI Language Index as well as for the individual PELI subtests: Alphabet Knowledge, Vocabulary-Oral Language, Comprehension, and Phonological Awareness. The PELI benchmarks and cut points for risk are based on research examining the predictive validity of each score on the PELI at a particular point in time compared to later PELI scores as well as external outcome assessments of early literacy and language skills.

A *benchmark* indicates a level of skill at which children are likely to achieve the next PELI benchmark or early literacy outcome. Benchmarks for the PELI are based on research that examines the predictive validity of a score on a measure at a particular point in time, compared to later PELI measures and to early literacy and language outcome assessments. Children who score at or above the benchmark and who receive effective early literacy instruction and support are likely to achieve later early literacy outcomes.

Conversely, the *cut points for risk* indicate a level of skill below which children are unlikely to achieve subsequent early literacy outcomes without receiving additional or different instructional support. For children who have scores below the cut point for risk, the probability of achieving later early literacy benchmarks is low unless intensive support is provided.

The PELI benchmarks and cut points for risk provide three primary benchmark status levels that describe child performance: (a) At or Above Benchmark, (b) Below Benchmark, and (c) Well Below Benchmark. These levels are based on the overall likelihood of achieving specified benchmarks on subsequent PELI assessments or external measures of early literacy and language skills.

At or Above Benchmark. For children who score at or above the benchmark, the overall likelihood of achieving subsequent early literacy benchmarks is approximately 80% to 90%. These children are likely to benefit from effective core instruction to meet subsequent early literacy and language benchmarks. Within this range, the likelihood of achieving subsequent benchmarks is lower for children whose scores are right at the benchmark; the probability of achieving subsequent benchmarks and outcomes increases as scores increase (see *Table 1*). While a score at or above the benchmark indicates that the odds are in the child's favor of achieving the next benchmark, it is not a guarantee. If approximately 85% of children with scores at or above the benchmark meet the next benchmark or early literacy outcome, that means that 15% of children do not. Thus, children with scores just at the benchmark may still need supplemental support to achieve the next benchmark. It is important to attend to other risk factors when planning which students may need supplemental support for children, such as attendance, behavior, motivation, and other related skill areas.

To assist in setting goals for children that increase the likelihood of achieving later early literacy and language outcomes, the At or Above Benchmark level is subdivided into *At Benchmark* and *Above Benchmark* levels.

At Benchmark. In the At Benchmark range, the overall likelihood of achieving subsequent early literacy benchmarks is 70% to 85%. Some of these students, especially those with scores near the benchmark, may require monitoring and/or strategic support on specific component skills.

Above Benchmark. In the Above Benchmark range, the overall likelihood of achieving subsequent early literacy benchmarks is 90% to 99%. While all students with scores in this range will likely benefit from core support, some students with scores in this range may benefit from instruction on more advanced skills.

Below Benchmark. Between the benchmark and cut point for risk is a range of scores where it is more difficult to predict future performance. For children with scores in this range, the overall likelihood of achieving subsequent early literacy benchmarks is approximately 40% to 60%. These children are likely to need strategic support to ensure their achievement of future benchmarks. To ensure that the greatest number of children achieve later early literacy success, it is best for children with scores in this range to be monitored regularly to ensure that they are making adequate progress and to receive increased or modified support if necessary to achieve subsequent early literacy benchmarks.

Well Below Benchmark. For children who score below the cut point for risk, the overall likelihood of achieving subsequent early literacy benchmarks is low, approximately 10% to 20%. These children are identified as likely to need intensive support. Intensive support might entail:

- delivering instruction in a smaller group or individually,
- providing more instructional time or more practice,
- presenting smaller skill steps in the instructional hierarchy,
- providing more explicit modeling and instruction, and/or
- providing greater scaffolding and practice.

We recommend that progress of children receiving intensive support receive frequent progress monitoring using Quick Checks with intervention modified as needed to ensure adequate progress.

Table 1 summarizes the design specifications for achieving later early literacy outcomes and provides descriptions for the likely need for support for each of the benchmark status levels. While there is an overall likelihood for each benchmark status level, within each level the likelihood of achieving later reading outcomes increases as students' scores increase. This is illustrated in the first column of *Table 1.*

Table 1.
Performance Interpretations for Benchmarks and Cut Points

Likelihood of Meeting Later Reading Benchmarks	Benchmark Status	Benchmark Status Including Above Benchmark	What it Means for Children With Scores in This Range
>99% 95% 90% 80% 70% 60%	**At or Above Benchmark** *overall likelihood of achieving subsequent early literacy benchmarks: 80% to 90%*	**Above Benchmark** *overall likelihood of achieving subsequent early literacy benchmarks: 90% to 99%*	The odds of achieving early literacy benchmarks and outcomes are very good. These children are likely to benefit from effective core instruction. Some of these children may benefit from instruction on more advanced early literacy and language skills.
		At Benchmark *overall likelihood of achieving subsequent early literacy benchmarks: 70% to 85%*	The odds are in favor of achieving subsequent early literacy benchmarks. These children likely need effective core instruction. Some of these children may require monitoring and strategic support in targeted skill areas.
55% 50% 45% 40%	**Below Benchmark** *overall likelihood of achieving subsequent early literacy benchmarks: 40% to 60%*	**Below Benchmark** *overall likelihood of achieving subsequent early literacy benchmarks: 40% to 60%*	The overall odds of achieving subsequent early literacy benchmarks are difficult to predict. Within this range, the closer children's scores are to the benchmark, the better the odds. The closer the children's scores are to the cut point, the lower the odds. These children likely need core instruction coupled with strategic support targeted to individual needs. For some children who have scores close to the benchmark, effective core instruction may be sufficient. Children whose scores are close to the cut point may require intensive support.
30% 20% 10% <5%	**Well Below Benchmark** *overall likelihood of achieving subsequent early literacy benchmarks: 10% to 20%*	**Well Below Benchmark** *overall likelihood of achieving subsequent early literacy benchmarks: 10% to 20%*	The overall odds of achieving subsequent early literacy benchmarks are low. These children likely need intensive support.

The addition of the Above Benchmark status level has not changed the benchmarks. A benchmark is still the point at which the odds are in the student's favor of meeting later reading benchmarks (approximately 60% likelihood or higher). The higher above the benchmark the student scores, the better the odds. For students who are already at benchmark, the Above Benchmark status level also provides a higher benchmark to aim for. "Overall likelihood" refers to the approximate percentage of students within the category who achieve later benchmarks, although the exact percentage varies by grade, year, and measure. Instructional decisions should be made based on students' patterns of performance across all measures, in addition to other available information on student skills, such as diagnostic assessment or in-class work. Acadience is a registered trademark of Acadience Learning LLC. www.acadiencelearning.org

The PELI benchmarks and cut points for risk, along with a brief description of how the PELI benchmarks were developed, are described in the sections below.

Development of PELI Benchmarks

The PELI benchmarks, cut points for risk, Language Index, and Composite Score were developed in a series of studies over a two-year period. The first study included 274 3- to 4-year-old children and 2,472 4- to 5-year-old children from 217 preschool classrooms in 37 early childhood programs in nine states representing all four census regions of the U.S. In the second study, a total of 3,233 children participated from 106 schools located in 15 states representing all census regions of the U.S. The children who were 3 to 4 years old were 2 years away from kindergarten entry at the beginning of the school year; the 4-to-5-year-old children were eligible for kindergarten the following year. Participants encompassed all children across general education classrooms who were receiving English instruction, including students with disabilities and students who were English language learners, provided they had the response capabilities to participate.

The benchmarks represent a series of conditional probabilities of meeting later important early literacy outcomes. The following outcome criteria were used to develop and evaluate the benchmark goals and cut points for risk:

The 40th percentile on the Clinical Evaluation of Language Fundamentals: Preschool-2, Expressive Language Index (Wiig et al., 2004) was used in the first study as an outcome measure for the Vocabulary-Oral Language and Comprehension subtests as well as for the PELI Language Index and PELI Composite Score.

The 40th percentile on the Peabody Picture Vocabulary Test, 4th Edition (PPVT-4; Dunn & Dunn, 2007) was used as an outcome measure for the Vocabulary-Oral Language and Comprehension subtests as well as for the PELI Language Index and PELI Composite Score in the second study.

The beginning-of-kindergarten Reading Composite Score on Acadience Reading K–6 was used in both studies as the outcome measure for the Alphabet Knowledge and Phonological Awareness subtests as well as for the PELI Composite Score.

Data collection included administering the PELI measures to participating children three times a year, at the beginning, middle, and end of the year. Outcome measures were administered to a randomly selected subgroup of children at the end of the year.

PELI Composite Score and Language Index

The PELI Composite Score is a combination of multiple PELI scores and provides the best overall estimate of the student's early literacy skills. The PELI Composite Score is calculated using the following formula:

PCS = (2 * AK) + (4 * Comp) + (4 * PA) + (3 * VOL)

PCS = PELI Composite Score; AK = Alphabet Knowledge Total Score; Comp = Comprehension Total Score; PA = Phonological Awareness Total Score; VOL = Vocabulary-Oral Language Total Score.

The purpose of the calculation is to weight the scores for each subtest so that they contribute approximately equally to the PELI Composite Score.

The PELI Language Index combines the Vocabulary-Oral Language and Comprehension scores and is a better indicator of overall language skill than either subtest alone. The PELI Language Index is calculated by applying the same multipliers used to weight the Vocabulary-Oral Language and Comprehension scores for the PELI Composite Score.

Acadience Learning Online (ALO) automatically calculates the PELI Composite Score and PELI Language Index.

Equated Scores

While every effort was made to design the PELI to have all forms be equally difficult, small variations in difficulty exist between forms. To increase the likelihood that differences in a child's scores across different forms are due to actual differences in child performance rather than difficulty of the forms, an equipercentile linking study was conducted to equate all 10 alternate forms of the PELI. Equipercentile linking is an approach to equating forms in which scaled scores from one form are linked to a common form through percentile ranks (Kirkpatrick et al., 2012; Livingston, 2004). Equated scores were computed for the PELI Composite Score and the PELI Language Index only; subtest scores were not equated. For users of ALO, the PELI Composite Score and PELI Language Index are automatically converted to equated scores. For PELI users who do not use ALO, look-up tables for equated scores are provided in Appendices J and K in the PELI Assessment Manual.

References

Dunn, L. M., & Dunn, D. M. (2007). *Peabody Picture Vocabulary Test, 4th Edition.* Minneapolis, MN: Pearson Assessments.

Kirkpatrick, R., Turhan, A., & Lin, J. (2012, April). *Linking two assessment systems using common-item IRT method and equipercentile linking method.* Paper presented at the Annual Meeting of the National Council of Measurement in Education, Vancouver, CA.

Livingston, S.A. (2004). Equating test scores (without IRT). Princeton, NJ: Educational Testing Service.

Wiig, E. H., Secord, W. A., & Semel, E. (2004). *Clinical Evaluation of Language Fundamentals: Preschool-2.* New York, NY: Pearson.

Benchmarks and Cut Points for Risk for 3-to-4-Year-Old Children

PELI Measure	Benchmark Status	Likely Need for Support	Beginning of Year	Middle of Year	End of Year
Alphabet Knowledge	Above Benchmark	Likely to Need Core Support[a]	2 +	6 +	11 +
	At Benchmark	**Likely to Need Core Support[b]**	**1**	**3 - 5**	**5 - 10**
	Below Benchmark	Likely to Need Strategic Support	*0*	*1 - 2*	*2 - 4*
	Well Below Benchmark	Likely to Need Intensive Support		0	0 - 1
Phonological Awareness	Above Benchmark	Likely to Need Core Support[a]		2 +	7 +
	At Benchmark	**Likely to Need Core Support[b]**		**1**	**2 - 6**
	Below Benchmark	Likely to Need Strategic Support		*0*	*0 - 1*
	Well Below Benchmark	Likely to Need Intensive Support			
Vocabular-Oral Language	Above Benchmark	Likely to Need Core Support[a]	13 +	16 +	19 +
	At Benchmark	**Likely to Need Core Support[b]**	**8 - 12**	**12 - 15**	**14 - 18**
	Below Benchmark	Likely to Need Strategic Support	*4 - 7*	*6 - 11*	*8 - 13*
	Well Below Benchmark	Likely to Need Intensive Support	0 - 3	0 - 5	0 - 7
Comprehension	Above Benchmark	Likely to Need Core Support[a]	10 +	14 +	15 +
	At Benchmark	**Likely to Need Core Support[b]**	**6 - 9**	**10 - 13**	**11 - 14**
	Below Benchmark	Likely to Need Strategic Support	*2 - 5*	*5 - 9*	*7 - 10*
	Well Below Benchmark	Likely to Need Intensive Support	0 - 1	0 - 4	0 - 6
PELI Language Index	Above Benchmark	Likely to Need Core Support[a]	87 +	109 +	119 +
	At Benchmark	**Likely to Need Core Support[b]**	**62 - 86**	**87 - 108**	**100 - 118**
	Below Benchmark	Likely to Need Strategic Support	*33 - 61*	*50 - 86*	*59 - 99*
	Well Below Benchmark	Likely to Need Intensive Support	0 - 32	0 - 49	0 - 58
PELI Composite Score	Above Benchmark	Likely to Need Core Support[a]	104 +	140 +	167 +
	At Benchmark	**Likely to Need Core Support[b]**	**68 - 103**	**101 - 139**	**128 - 166**
	Below Benchmark	Likely to Need Strategic Support	*35 - 67*	*59 - 100*	*85 - 127*
	Well Below Benchmark	Likely to Need Intensive Support	0 - 34	0 - 58	0 - 84

Note. Benchmarks and cut points for risk for the PELI Language Index and the PELI Composite Score are based on equated scores. The benchmark is the number that is **bold**. The cut point for risk is the number that is *italicized*.
[a]Some students may benefit from instruction on more advanced skills.
[b]Some students may require monitoring and strategic support on component skills.

Benchmarks and Cut Points for Risk for 4-to-5-Year-Old Children

PELI Measure	Benchmark Status	Likely Need for Support	Beginning of Year	Middle of Year	End of Year
Alphabet Knowledge	Above Benchmark	Likely to Need Core Support[a]	16 +	24 +	25 +
	At Benchmark	**Likely to Need Core Support[b]**	**6** - 15	**17** - 23	**23** - 24
	Below Benchmark	Likely to Need Strategic Support	*2* - 5	*8* - 16	*14* - 22
	Well Below Benchmark	Likely to Need Intensive Support	0 - 1	0 - 7	0 - 13
Phonological Awareness	Above Benchmark	Likely to Need Core Support[a]	9 +	13 +	15 +
	At Benchmark	**Likely to Need Core Support[b]**	**4** - 8	**10** - 12	**13** - 14
	Below Benchmark	Likely to Need Strategic Support	*1* - 3	*4* - 9	*9* - 12
	Well Below Benchmark	Likely to Need Intensive Support	0	0 - 3	0 - 8
Vocabular-Oral Language	Above Benchmark	Likely to Need Core Support[a]	22 +	25 +	27 +
	At Benchmark	**Likely to Need Core Support[b]**	**18** - 21	**21** - 24	**23** - 26
	Below Benchmark	Likely to Need Strategic Support	*13* - 17	*16* - 20	*19* - 22
	Well Below Benchmark	Likely to Need Intensive Support	0 - 12	0 - 15	0 - 18
Comprehension	Above Benchmark	Likely to Need Core Support[a]	16 +	19 +	19 +
	At Benchmark	**Likely to Need Core Support[b]**	**13** - 15	**16** - 18	**17** - 18
	Below Benchmark	Likely to Need Strategic Support	*10* - 12	*12* - 15	*14* - 16
	Well Below Benchmark	Likely to Need Intensive Support	0 - 9	0 - 11	0 - 13
PELI Language Index	Above Benchmark	Likely to Need Core Support[a]	136 +	148 +	156 +
	At Benchmark	**Likely to Need Core Support[b]**	**114** - 135	**132** - 147	**143** - 155
	Below Benchmark	Likely to Need Strategic Support	*88* - 113	*111* - 131	*124* - 142
	Well Below Benchmark	Likely to Need Intensive Support	0 - 87	0 - 110	0 - 123
PELI Composite Score	Above Benchmark	Likely to Need Core Support[a]	200 +	236 +	256 +
	At Benchmark	**Likely to Need Core Support[b]**	**159** - 199	**201** - 235	**231** - 255
	Below Benchmark	Likely to Need Strategic Support	*115* - 158	*160* - 200	*195* - 230
	Well Below Benchmark	Likely to Need Intensive Support	0 - 114	0 - 159	0 - 194

Note. Benchmarks and cut points for risk for the PELI Language Index and the PELI Composite Score are based on equated scores. The benchmark is the number that is **bold**. The cut point for risk is the number that is *italicized*.
[a]Some students may benefit from instruction on more advanced skills.
[b]Some students may require monitoring and strategic support on component skills.