

# Validity Report for Core5 and STAR

Lexia Reading Core5<sup>®</sup> Research Report

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## Introduction

According to the National Center for Education Statistics, only 36% of 4<sup>th</sup> graders in the United States performed at or above the Proficient level in reading on the 2015 National Assessment of Educational Progress. Only 18-21% of Black and Hispanic students performed at the Proficient level. It is well known that reading difficulties can pose major barriers to academic success. Thus, it is essential that students receive research-based instruction within a valid reading program.

This report documents the validity of the Lexia Reading Core5® (Core5) technology-based instructional program as a measure of reading ability. A program's level of validity relates to whether it effectively measures what it claims to measure. The validity of Core5 was evaluated and strong relationships were found with an established reading assessment. Based on these findings, stakeholders can confidently adopt Core5 as an essential part of their school's literacy program.

## Overview of Lexia Reading Core5

Core5 is designed to accelerate student mastery of reading skills in grades Pre-K through 5. In the online component of Core5, students develop essential literacy skills in the areas of phonological awareness, phonics, structural analysis, fluency, vocabulary, and comprehension. The program provides guidance for using offline teacher-led lessons and student-led activities to increase automaticity and help students generalize the skills they have learned.

When students begin Core5, an auto placement feature determines an appropriate start level in the program. Students who used Core5 during the previous school year continue where they left off in the spring. In the program, students must achieve 90%-100% accuracy to advance to the next level. Students are considered to have reached their end-of-year, grade-level benchmark once they have completed all Core5 content that corresponds to their grade level.

## Core5 Performance Measures

### Performance Predictor Scores

As a component of Lexia's embedded Assessment Without Testing® tool, students receive a monthly Performance Predictor score which estimates their percent chance of reaching their end-of-year (EOY), grade-level benchmark in Core5. Predictor scores are derived from formulas based on norm-referenced data that vary by student grade and month. These formulas contain up to five Core5 performance variables (e.g., Core5 level, cumulative minutes of Core5 use, etc.). A Predictor score can be interpreted as follows: "If this student continues to work at a similar pace and amount of time as in previous months, his/her chance of reaching EOY, grade-level benchmark is ## percent."

Predictor scores are organized into three risk levels: On Target (80-99%), Some Risk (31-79%), and High Risk (1-30%). Based on their risk level and grade, students are given a weekly usage target (20-80 minutes) that is updated monthly. Consistently meeting usage targets and making progress in Core5 increases the likelihood that students will reach their EOY, grade-level benchmark. Thus, Predictor scores may change over time as a result of providing sufficient access to Core5 and individualizing instruction for Some Risk and High Risk students.

For the correlation analyses, Predictor scores were selected for two time points based on typical school assessment schedules:

Beginning-of-Year Predictor Score: Based on Core5 performance through the end of October and provided on November 1<sup>st</sup>.

Middle-of-Year Predictor Score: Based on Core5 performance through the end of January and provided on February 1<sup>st</sup>.

### Benchmark Status

Benchmark status is based on whether students have or have not reached their EOY, grade-level benchmark in Core5. Students are considered to have reached their EOY, grade-level benchmark once they have completed all Core5 content that corresponds to their grade level. For example, students in grade 1 who have completed material through Level 9 in Core5 by the end of the school year have reached their benchmark.

## Key Terms

**Validity** is the degree to which an assessment (or program) measures what it claims to measure. The term validity is similar to *accuracy*. For example, one could ask, “How *accurately* does my school’s reading assessment measure reading ability?” If an assessment is valid, we can draw conclusions about the ability it measures. In this document, we consider **criterion validity**, which compares the Core5 performance measures with an established measurement tool.

**Correlation** is a statistical test used to evaluate criterion validity. It quantifies the strength of the relationship between two sets of measures for the same individuals. In most cases, criterion validity correlations will be positive (i.e., range between 0 and 1). A positive correlation indicates that individuals who have high scores on one measure tend to have high scores on the second measure, and individuals who have low scores on one measure tend to have low scores on the second measure. Correlations can be categorized into three ranges: *High*: .7 – .9, *Medium*: .4 – .6, and *Low*: 0 – .3.

Correlations in the medium or high range are considered **strong** when evaluating a reading assessment (or program). A strong correlation indicates that measures obtained from the reading assessment are related to measures obtained from the established measurement tool. Accordingly, one can conclude the reading assessment is a valid measure of reading ability.

**Alignments** show that two sources of information – such as content areas or performance categories – correspond with each other. This report further evaluates validity of an instructional program by aligning program performance with proficiency categories on an outside assessment.

### Types of Assessment Tools

**Progress monitoring tools** are used to assess student performance over time and to quantify response to instruction. They are relatively quick to administer and are given multiple times throughout the school year, usually more frequently for high risk students.

**Outcome measurement tools** are most often annual assessments with the purpose of obtaining an overall index of ability. They take longer to administer and are typically given at the end of the school year.

## Validity of Lexia Reading Core5<sup>®</sup> with STAR Early Literacy<sup>™</sup> and STAR Reading<sup>™</sup>

The STAR Early Literacy and STAR Reading assessments are brief, computer-adaptive progress monitoring tools. The STAR assessments are standardized for grades pre-K-3 (Early Literacy) and grades 1-12 (Reading); for grades 1-3, either the Early Literacy or Reading assessment can be administered based on the student's individual ability level. The following sections present correlations between Core5 performance measures and STAR scores, as well as descriptive statistics that illustrate the alignment between Core5 performance and STAR proficiency.

### Sample

Measures were collected from 15 schools in California. Each school contributed STAR scores for a minimum of 100 students. Students in the analyses used Core5 for at least 20 weeks during the 2015-2016 school year, and they met usage targets for at least 50% of their weeks of use. Students included in the analyses had STAR scores from one or more time points: beginning-of-year (BOY), middle-of-year (MOY), and end-of-year (EOY). Analyses were based on a total of 3,453 students across grades K-5. Sample sizes differed by grade and time point due to the availability of data. Scores for students in grades K-1 are from STAR Early Literacy, and scores for students in grades 2-5 are from STAR Reading.

### Results

**Correlations.** To assess criterion validity, correlations were obtained between Core5 performance measures and STAR percentile scores for each grade at three time points. In all but one instance, the pairwise correlations were significant ( $p < .001$ ) and fell within the medium (.4-.6) range, which is considered strong when evaluating a reading assessment (or program).

Grade	Correlations between BOY Core5 Predictor scores & BOY STAR percentile scores		Correlations between MOY Core5 Predictor scores & MOY STAR percentile scores		Correlations between EOY Core5 Benchmark status & EOY STAR percentile scores	
	<i>R</i>	<i>N</i>	<i>R</i>	<i>N</i>	<i>p</i>	<i>N</i>
K (EL)	.5	127	.4	124	.2 <sup>a</sup>	131
1 (EL)	.4	646	.6	598	.5	648
2 (R)	.6	792	.6	754	.5	798
3 (R)	.6	819	.6	771	.5	820

<sup>a</sup> The low correlation for kindergarteners at EOY ( $p = .2$ ,  $p = .014$ ) was due to restricted variability in Core5 performance. Close to 90% of kindergarteners reached EOY, grade-level benchmark in Core5.

4 (R)	.6	538	.6	545	.6	562
5 (R)	.7	476	.7 <sup>b</sup>	494	.6	494

Note. R = Pearson 's product-moment correlation coefficient;  $\rho$  = Spearman's rank correlation coefficient or rho.

**Alignment between Core5 and STAR at End-of-Year.** The following table shows how well the students with On Target Predictor scores in Core5 (from BOY and MOY) performed on STAR at EOY. To determine these relationships, STAR percentile scores from EOY were classified as below the 40<sup>th</sup> percentile or at/above the 40<sup>th</sup> percentile. This is a common cut-off point to assess proficiency on reading assessments. Of the students who had On Target Predictor scores in Core5 at BOY or MOY, over 90% in grades K-1 and over 80% in grades 2-5 performed at/above the 40<sup>th</sup> percentile on STAR at EOY.

Alignment Between Core5 On Target Predictor Scores and STAR Proficiency Categories		
Core5 <sup>c</sup>	STAR Early Literacy at EOY	
<i>Students in Grades K-1</i>	Below 40 <sup>th</sup> Percentile	At/Above 40 <sup>th</sup> Percentile
On Target in BOY (N = 258)	10%	90%
On Target in MOY (N = 728)	4%	96%
Core5	STAR Reading at EOY	
<i>Students in Grades 2-5</i>	Below 40 <sup>th</sup> Percentile	At/Above 40 <sup>th</sup> Percentile
On Target in BOY (N = 1,231)	18%	82%
On Target in MOY (N = 1,108)	17%	83%

The next table shows the alignment between reaching benchmark in Core5 and proficiency on STAR at the end of the school year. Of the students who reached EOY, grade-level benchmark in Core5, 90% in grades K-1 and 81% in grades 2-5 performed at/above the 40<sup>th</sup> percentile on STAR at EOY.

Alignment Between Core5 On Target Predictor Scores and STAR Proficiency Categories		
Core5	STAR Early Literacy at EOY	
<i>Students in Grades K-1</i>	Below 40 <sup>th</sup> Percentile	At/Above 40 <sup>th</sup> Percentile
Reached EOY Benchmark (N = 467)	10%	90%
Core5	STAR Reading at EOY	
<i>Students in Grades 2-5</i>	Below 40 <sup>th</sup> Percentile	At/Above 40 <sup>th</sup> Percentile
Reached EOY Benchmark (N = 1,509)	19%	81%

<sup>b</sup> The MOY Core5 Predictor scores for students in grade 5 are from January 1<sup>st</sup> due to a database error in which February 1<sup>st</sup> Predictor scores were not available.

<sup>c</sup> Out of 3,453 students in the sample, 3,398 had BOY Predictor scores with 1,489 (44%) On Target. In MOY, 3,292 students had Predictor scores with 1,316 (40%) On Target.

## Conclusion

This report found that Core5 performance measures are valid indicators of reading ability based on comparisons with an established progress monitoring tool. The significant correlations between Core5 performance measures and STAR Early Literacy and Reading percentile scores at the beginning, middle, and end of the year provide evidence that the program is a valid measure of reading ability. Additionally, when students are On Target or reach benchmark, their performance in Core5 is associated with proficiency on STAR. These findings show that the Core5 program is a valid measure of reading ability and that Core5 can serve not only as an instructional program, but as a key component in a school's assessment of literacy skills.