



# Ohio

## Comparability Study Kindergarten Readiness Assessment and KRA-L

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# Comparability Study

## Overview of the Comparability Study

The purpose of the Kindergarten Readiness Assessment is to provide information to stakeholders at the local, regional and state levels about how well prepared children are for kindergarten. School, local district and state leaders will learn about children's levels of preparedness, which will enable programmatic decision making at the school, district and state levels. Families, caregivers and kindergarten teachers will learn about each child's skills, learning and developmental needs. Teachers can identify strengths and weaknesses for each child, which can help them in planning for instruction. Additionally, districts can use the Language and Literacy domain of the Kindergarten Readiness Assessment to determine on-track/not-on-track status to meet Ohio's Third Grade Reading Guarantee requirement.

From fall 2004 to fall 2013, Ohio used the Kindergarten Readiness Assessment-Literacy (KRA-L) to assist educators and local communities in the evaluation of the literacy skills of entering kindergarten students. Local communities used the KRA-L results to establish strategic goals and track a trajectory of readiness for children entering kindergarten. School districts also used KRA-L results as a measure for determining on-track/not-on-track status to meet Ohio's Third Grade Reading Guarantee requirement. The new comprehensive Kindergarten Readiness Assessment replaced the KRA-L in fall 2014. During the 2014-2015 school year, the Ohio Department of Education and WestEd conducted a comparability study to analyze the Language and Literacy domain of the new Kindergarten Readiness Assessment in relation to the (legacy) KRA-L.

## Purpose

The purpose of the comparability study was to compare, at the overall state level, the distribution of scores and proficiency rates across the two assessments resulting in a concordance table linking the scores of the two assessments. Programs can use the concordance table to relate performance on the new Kindergarten Readiness Assessment Language and Literacy domain to historic performance on the KRA-L.

## Comparison of Assessment Content

The new Kindergarten Readiness Assessment is based on Ohio's Early Learning and Development Standards adopted in October 2012, whereas the KRA-L was based on Ohio's previous standards for preschool. Both assessments measure skills in reading, speaking and listening, and language. The new Kindergarten Readiness Assessment also measures writing skills.

Table 1.1 shows the blueprints for both assessments in a side-by-side comparison. One implication of the blueprint differences is that an equating study could not be completed to compare the scores on the two assessments. Although the two assessment measure similar content, they are not equivalent.

**Table 1.1—Blueprint Comparison**

New Kindergarten Readiness Assessment Essential Skill or Knowledge	Selected Response	Performance Task	Observational Rubric	Points	Corresponding KRA-L Essential Skill or Knowledge	Selected Response	Performance Task	Points
<b>Strand: Reading</b>								
Before interactive read-alouds, make predictions and/or ask questions about the text by examining the title, cover, illustrations/photographs, graphic aids and/or text.	1			1				
During interactive read-alouds, listen and ask and answer questions as appropriate.	1			1	Attend to speakers, stories, poems and songs.		4	4
After interactive read-alouds, respond by retelling the text or part of the text in an appropriate sequence, using discussions, re-enactment, drawing and/or writing as appropriate.		1		3				
Identify initial and final sounds in spoken words.	1			1	Recognize when words share phonemes and repeat the common phoneme.	4		4
Identify, blend and segment syllables in spoken words.		1		3				
Recognize rhyming words in spoken language.	2			2	Identify matching sounds and recognize rhymes in familiar stories, poems, songs and words.	7	5	12
Demonstrate basic knowledge of one-to-one letter-sound correspondences by producing the most frequent sound for some consonants.		1		2				
Recognize and name some upper- and lowercase letters.		1		3	Recognize and name some upper- and lowercase letters in addition to those in first name.		2	6
<b>Strand: Speaking &amp; Listening</b>								
Speak or express thoughts, feelings and ideas clearly enough to be understood in a variety of settings.			1	2	Speak clearly and understandably to express ideas, feelings and needs.		3	3
Participate in conversations with adults and peers, staying on topic through multiple exchanges and adding appropriate ideas to support or extend the conversation.			1	2	Connect information and events to personal experiences by sharing or commenting.		X*	X*
<b>Strand: Writing</b>								
With modeling and support, print letters of own name.		1		2				
With modeling and support, print meaningful words with letters and letter approximations.		1		2				
<b>Strand: Language</b>								
Use familiar nouns and verbs to describe persons, animals, places, events, actions, etc.		2		6				
Use frequently occurring prepositions (e.g., "to," "from," "in," "out," "on," "off," "for," "of," "by," "with").		1		3				
Determine the meanings of unknown words/concepts using the context of conversations, pictures that accompany text, or concrete objects.	1			1				
<b>KRA Totals</b>	<b>6</b>	<b>9</b>	<b>2</b>	<b>34</b>	<b>KRA-L Totals</b>	<b>11</b>	<b>14</b>	<b>29</b>

## Item Types

In addition to differences in content, there are differences in the item types on the two assessments. Both the new Kindergarten Readiness Assessment and the KRA-L contain selected response and performance task item types. The Kindergarten Readiness Assessment includes a third item type, observational rubric. A description of each item type is below:

A **selected response** item consists of a question or prompt, read by the test administrator, and two or more possible answer options of which there is only one correct answer. A child indicates his or her response by touching, pointing to, or saying his or her answer choice.

A **performance task** item consists of an activity or action that the child completes after the test administrator reads a prompt. In some instances, the test administrator provides manipulatives with performance-task items to allow the student to demonstrate a skill.

An **observational rubric** item describes a specific behavior or skill that the teacher observes during typical classroom activities. The teacher evaluates and scores each child's behavior or skill using a rubric with three performance levels of the skill or behavior.

## Study Design

The initial study design proposed by WestEd recommended double testing of a stratified representative sample of 400 Ohio students on all components of the KRA-L and the new Kindergarten Readiness Assessment. The recommended sample stratification variables included gender; race; district type (urban, suburban, rural); English language learner; and students with disabilities. Both the National Technical Advisory Council (convened for the development of the Ready for Kindergarten Assessments including new Kindergarten Readiness Assessment) and Ohio's State Technical Advisory Committee that advises the Ohio Department of Education on student assessments reviewed this proposal. Ohio's State Technical Advisory Committee recommended targeting a larger sample size to include oversampling at tails of KRA-L score distribution based on historic values at the building level to obtain an even distribution across prior year KRA-L scores. Table 1.2 shows the final sampling targets.

<b>Sample Size</b>	1000 students from 40-50 schools
<b>Representative Sampling Demographic Variables</b>	Gender Race District type (urban, suburban, small town, rural)
<b>Oversampling Demographic Variables</b>	English language learners Students with disabilities
<b>Additional Oversampling</b>	At tails of KRA-L score distribution based on historic values at the building level

## Sampling Procedure

The Ohio Department of Education recruited districts and schools over the summer 2014. Participation was open to all Ohio public schools on a volunteer basis. No one was turned away. Recruitment information was available to the general public on the Ohio Department of Education's website. Additionally, the department identified buildings that represented target demographic characteristics and desired KRA-L score distribution

based on historic values. Each of the identified buildings and parent districts received an email recruitment letter and at least one follow-up phone call. Further recruitment activities targeting suburban districts were completed that included engaging members of the Ohio Early Childhood Advisory Committee. Despite our best recruitment efforts to include variation in this voluntary sample, it did not include any districts of the suburban typology or community schools.

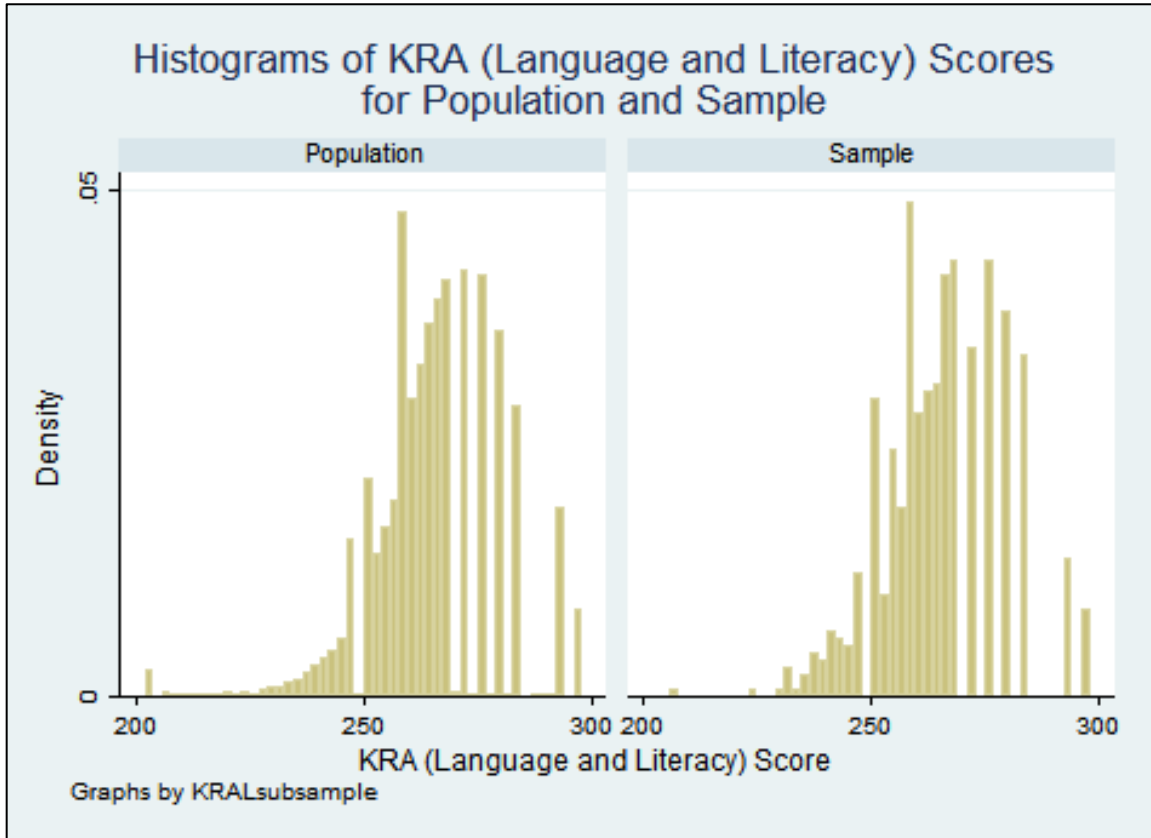
The department considered the following variables during the recruitment of schools: geographic location, district type, gender, race/ethnicity, socioeconomic status, English language learner and children with disabilities. The historical KRA-L results of the school or district also were considered in order to ensure a distribution of schools across performance bands. Ten districts agreed to participate in the study. Nine of those districts provided KRA-L data to the department for this study. The final comparability study sample included 735 students from nine schools in Ohio.

This study was limited by the available sample. The comparable sample score distributions of the two assessments permitted the development of a concordance table. However, the sample limited the precision of the concordance table at the tails of the distribution.

Table 1.3 summarizes the demographic information of the sample and the overall state population of kindergarten students in Ohio.

<b>Table 1.3—Summary of Demographic Information (Comparability Study Sample and State Population)</b>				
		<b>Comparability Study Sample (N = 735)</b>	<b>State Population (N = 132,872)</b>	<b>Difference</b>
<b>Gender</b>	Female	51.0	47.7	3.3
	Male	48.7	50.7	-2.0
	Unknown	0.3	1.6	-1.3
<b>Race/Ethnicity</b>	American Indian	0.3	0.1	0.2
	Asian	0.5	1.9	-1.4
	Black/African American	7.3	17.4	-10.1
	Hispanic	4.2	5.6	-1.4
	Multiple	4.9	5.6	-0.7
	Pacific Islander	0.1	0.1	0.0
	White	81.1	67.0	14.1
	Other/Unknown	1.5	2.3	-0.8
<b>Low Socioeconomic Status</b>	Yes	47.3	27.1	20.2
	No	47.6	60.4	-12.8
	Unknown	5.0	12.5	-7.5
<b>English Language Learner</b>	Yes	0.3	1.9	-1.6
	No	94.3	85.6	8.7
	Unknown	5.4	12.5	-7.1
<b>Individualized Education Plan</b>	Yes	6.9	6.9	0.0
	No	88.4	82.9	5.5
	Unknown	4.6	10.2	-5.6

The histograms below compare the distribution of Kindergarten Readiness Assessment (Language/Literacy domain) scores for the statewide kindergarten population and the comparability study sample. A two-sample Kolmogorov-Smirnov test for equality ( $D = 0.0238$ ,  $p\text{-value} = 0.808$ ) indicates that the comparability study sample and state population do not differ significantly in their distributions on the Kindergarten Readiness Assessment (Language/Literacy domain).



## Administration Procedures

All testing for this study was completed in fall 2014. Buildings participating in the study administered the Kindergarten Readiness Assessment-Literacy following the same procedures that they used in previous years including timeline, scheduling and test administrators. Additionally, they administered the new Kindergarten Readiness Assessment according to its specific procedures including timeline, scheduling and test administrators. This process ensures that the score information from the study will be as similar as possible to the previous years' KRA-L scores and as similar as possible to this and future years' Kindergarten Readiness Assessment scores. One exception to the standard administration procedures is that the same individual could not administer both assessments to the same child. Table 1.4 summarizes the administration guidelines for each assessment.



**Table 1.4—Summary of Administration Guidelines**

	<b>KRA-L</b>	<b>KRA (LL Domain)</b>
<b>Timeline</b>	No earlier than four weeks prior to the first day of school through Oct. 30	First day of school through Nov. 1*
<b>Administrator</b>	Teacher, parent volunteer, librarian, substitute teacher, other person designated by the school	District employee holding a current ODE-issued permit, license or certificate who completed the required training
<b>Procedure</b>	Administered either in the context of the classroom or in individual appointments	Administered only in the context of everyday classroom routines and activities
<b>Data Collection</b>	Excel spreadsheet to collect item scores and basic student information	Ready for Kindergarten Online system to collect item scores and demographic information

\*In order to use the Kindergarten Readiness Assessment for the Third Grade Reading Guarantee, the Language and Literacy domain had to be completed by Sept. 30.

### Data Collection

The Ready for Kindergarten Online system was built specifically for the administration of the new KRA and was the source of all demographic information. Data managers from Ohio school districts uploaded demographic data directly into Ready for Kindergarten Online. Upon completion of the administrations, researchers at WestEd matched the KRA-L data from the participating schools to the KRA data exported from the Ready for Kindergarten Online system. WestEd received KRA-L data for 771 students. The sample used for analysis consisted of 735 students. Researchers removed thirty-six (36) student records from the sample for one of two reasons: Twenty-one (21) records were excluded because the student record on the KRA-L data file had no match on the KRA data file, using state ID as the matching variable. Fifteen (15) records were excluded because the secondary matching variable (date of birth) did not match for the state ID.

### Results

As a result of using two comparable populations based on score distribution and demographic variables and considering on the Language and Literacy domain of the new Kindergarten Readiness Assessment, the results show how scores from the KRA-L relate to scores on the new Kindergarten Readiness Assessment. This information will allow districts to continue to use these data in longitudinal studies across cohorts of students. The concordance table matches the equivalent percentiles on the scale for both assessments. The concordance table (Table 1.5) links the KRA-L composite score (0–29) to the KRA (LL domain) scaled score (202–298) at each decile for the sample population.

<b>KRA-L Composite Score</b>	<b>KRA (LL Domain) Scaled Score</b>	<b>Equivalent Decile</b>
28–29	280–298	90
26–27	273–279	80
25	270–272	70
23–24	268–269	60
21–22	264–267	50
19–20	262–263	40
16–18	259–261	30
15–14	254–258	20
10–13	250–253	10
0–9	202–249	<10

### Using the Comparability Study Data

The concordance table from this study can be used to look at trends in language and literacy skills of children entering kindergarten over time. It is important to note that although both assessments measure language and literacy skills, the assessment content, methods and score ranges differ between the two assessments. Also, the concordance table has greater discrimination in the mid-score range. That being said, the following pages will describe examples of how communities and districts can use the previous KRA-L and current KRA data.

### Using KRA-L Percent Score Band Data

Communities and districts have long used KRA-L scores to set projection targets for upcoming years, or compare performance groups across years. Historically, KRA-L scores were divided into three score bands: Band 1 (score 0-13), Band 2 (score 14-23) and Band 3 (score 24-29). The three bands were used to guide decisions about further assessment and instruction, including for use with Ohio’s Third Grade Reading Guarantee. The KRA-L data that are publically available on the Ohio Department of Education website are aggregated by percent of students whose scores fell in each score band. Data are available at the building, district and state levels. To compare data using KRA-L score band, sort Kindergarten Readiness Assessment Language and Literacy domain scaled score data by KRA-L bands using the concordance table. Then, report percent of kindergarten students scoring in each equivalent KRA-L band.

### Concordance Table: Collapsed by KRA-L score bands

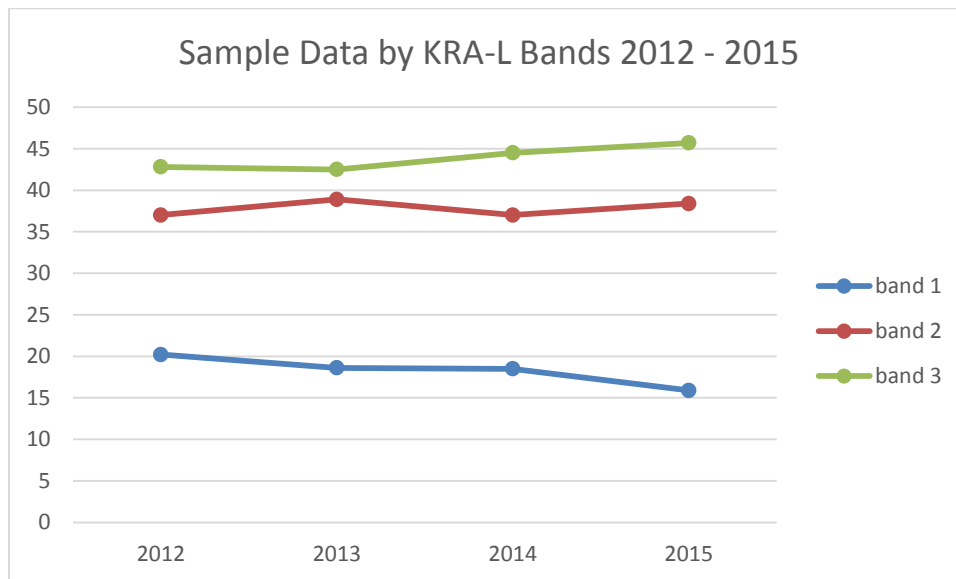
<b>KRA-L Score</b>	<b>KRA (LL Domain) Scaled Score</b>
24-29	269-298
14-23	254-268
0-13	202-253



Example: Comparison using KRA-L Score Bands

Year	KRA-L % Band 1	KRA-L % Band 2	KRA-L % Band 3
KRA* 2014	15.9%	38.4%	45.7%
2013-2014	18.5%	37.0%	44.5%
2012-2013	18.6%	38.9%	42.5%
2011-2012	20.2%	37.0%	42.8%

\*KRA – Kindergarten Readiness Assessment Language and Literacy Domain Only



Using KRA-L Raw Score Data

Individuals who have access to both raw score data for the KRA-L and scaled score data for KRA have another option for how to use the concordance table, which provides greater precision when analyzing data trends over time. To compare data using KRA Language and Literacy cut score data, sort KRA Language and Literacy domain scaled score data and KRA-L raw score data by on-track/not-on-track status using a KRA-L cut score of 20. Report the percent of kindergarten students scoring in each category for each administration year. In the example below, children scoring in the on-track category on the KRA-L from 2011-2013 remained relatively stable. The KRA data from fall 2014 shows a small increase in students scoring in the on-track category when compared to the previous years' KRA-L data.

NOTE: Only raw score information was available for determining on-track/not-on-track status in fall 2014. The process described here will most likely result in on-track/not-on-track categorization that does not match what was reported to ODE for fall 2014. However, the scaled score is the most appropriate data to use for making comparisons across years.

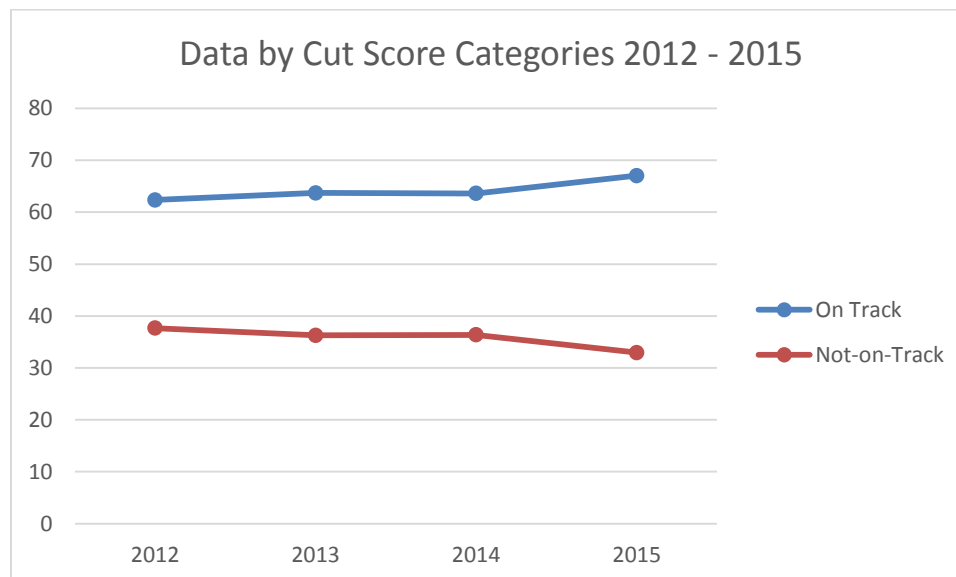
Concordance Table: Collapsed by Cut Score

Status	KRA-L Score	KRA (LL Domain) Scaled Score
On-Track	20-29	263-298
Not-on-Track	0-19	202-262

Example: Comparison Using Cut Score

Year	On-Track	Not-on-Track
KRA* 2014	67.0%	33.0%
2013-14	63.6%	36.4%
2012-13	63.7%	36.3%
2011-12	62.3%	37.7%

\*KRA – Kindergarten Readiness Assessment Language and Literacy Domain Only



**Inappropriate Uses of the KRA Data**

There are potentially many inappropriate uses of the KRA data, in general, and the comparability data specifically. While the decile comparison of raw KRA-L scores to scaled KRA Language and Literacy scores does show that the two assessments are comparable and that at the decile level both tests group students similarly, one should not attempt to create scale scores for the KRA from the raw KRA-L scores. Nor should one attempt to divide the KRA scores into groupings smaller than the KRA-L bands.

The comparability study shows that the assessments are comparable, not equal. Therefore, it is inappropriate to attempt to create equating tables to match up KRA-L scores with KRA scores. At large grain sizes (the KRA-L bands and the on-track or not-on-track ratings) the comparison is appropriate, but because the assessments used different methods to get to similar constructs and because the KRA assesses a wider range of constructs, it would not be appropriate to interpret the data on a point-by-point analysis.

The KRA results cannot be used to prevent children from entering kindergarten when they are age eligible or to counsel parents into delaying kindergarten entry or withdrawing children from kindergarten. Further, the KRA data cannot be used to determine special education eligibility, kindergarten early entrance eligibility or as part of a teacher's performance evaluation. The comparability study data, specifically, should not be used to measure preschool or kindergarten teacher effectiveness from year to year.

## **Conclusion**

The goal of this comparison study was to relate the Language and Literacy domain of the new Kindergarten Readiness Assessment to the previous Kindergarten Readiness Assessment-Literacy (KRA-L). This study will help schools, districts and other interested groups who have used the KRA-L as a measure of the effectiveness of preschool programs and other early childhood interventions designed to improve kindergarten readiness transition to using the new assessment data.

If you have questions about how to use KRA-L and KRA data, please contact Lauren Monowar-Jones at 614-728-1759 or [Lauren.Monowar-Jones@education.ohio.gov](mailto:Lauren.Monowar-Jones@education.ohio.gov)