

Default Cut Scores for MAP Growth Reading and Mathematics Assessments

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Sarah-Truclinh Tran
Rudraxi Majumdar
Ann Hu
J. Patrick Meyer

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Executive Summary

This document presents the default cut scores that can be used by partners without their own linking study to classify students into *Below Standards*, *Proficient*, or *Advanced* performance levels on MAP® Growth™ for reading and mathematics in Grades 3–8. The default cut scores, presented in Table E.1, were derived from the median Rasch Unit (RIT) cut scores from published NWEA® linking studies across 39 states (Hu, 2021) and their associated percentiles from the 2020 norms (Thum & Kuhfeld, 2020). They are known as the “default” cut scores because they are automatically applied to score reports when a partner does not have their own linking study between MAP Growth and their summative assessment.

Table E.1. MAP Growth Default Cut Scores

Grade	<i>Proficient</i>		<i>Advanced</i>	
	Median RIT	Percentile	Median RIT	Percentile
Reading				
3	201	59	214	85
4	208	58	220	82
5	214	57	226	83
6	218	57	230	82
7	221	56	236	86
8	224	56	238	83
Mathematics				
3	202	53	214	82
4	213	56	226	84
5	224	62	237	86
6	227	59	240	84
7	232	61	246	85
8	237	63	252	86

For many years, NWEA has used the 40th and 70th percentiles as the default *Proficient* and *Advanced* cut scores for partners without a linking study. This current study was conducted to update these values using a more deliberate method with expanded and more recent data. The updated default cut scores in Table E.1 reveal that the 40th and 70th percentile cut values are too low for today’s performance level standards.

The process of identifying the new default cut scores began with an evaluation of data from the 39 linking studies completed by August 2021. A group of NWEA experts deliberated possible approaches and reached a consensus that the cut scores should be subject- and grade-specific to reflect states’ current designations of *Proficient* and *Advanced* performance and what is seen in real-world proficiency rates. For example, it meaningfully depicts that the Grade 3 performance level tends to be lower than what is seen in higher grades.

It is important to note that the default cut scores were not derived from the standard NWEA linking study procedure and should not be applied the same way as the results from a linking study. The default cut scores can be used by partners without their own linking study as an indication of student performance on MAP Growth relative to the performance standards set by MAP Growth users across states. They should not be used to predict student performance on any summative assessment. Cut scores from partner-specific linking studies are always preferred over the default cut scores.

1. Introduction

This document presents the default cut scores that can be used by partners without their own linking study to classify students into *Below Standards*, *Proficient*, or *Advanced* performance levels on MAP® Growth™ for reading and mathematics in Grades 3–8. The default cut scores were derived from the median Rasch Unit (RIT) cut scores from published NWEA® linking studies across 39 states (Hu, 2021) and their associated percentiles from the 2020 norms (Thum & Kuhfeld, 2020). They are known as the “default” cut scores because they are automatically applied to score reports when a partner does not have their own linking study between MAP Growth and their summative assessment. They are provided for reading and mathematics in Grades 3–8 only as a result of the available data in the 39 published linking studies used in this study.

MAP Growth linking study results allow educators to use students’ RIT scores from fall, winter, and spring to predict students’ performance levels on the summative tests that are often administered at the end of an academic school year. Students who appear at risk of missing the proficiency mark may then be given appropriate support that aligns with their unique learning trajectories.¹ As such, linking studies are a critical part of the NWEA mission to enhance classroom learning. However, some partners do not have a linking study for their summative assessment. These include international schools and U.S. states that do not meet the minimum sample size requirements from recruitment. For these partners, the practice has been to use the following percentile thresholds for classifying student performance on MAP Growth assessments:

- *Below Standards*: 1st – 39th percentile
- *Proficient*: 40th – 69th percentile
- *Advanced*: 70th – 99th percentile

These thresholds were inferred from *The Proficiency Illusion* report by Cronin et al. (2007). However, the thresholds now have critical limitations. First, the purpose of the Cronin et al. (2007) study was not to intentionally determine the default cut scores but to investigate states’ expectations for proficiency in reading and mathematics before and after the implementation of No Child Left Behind (NCLB). Second, the study only included data from 26 states. Finally, the study was based on data from the NCLB era about 17 years ago when states’ expectations for proficiency were different from what they are today. Therefore, a new study was conducted with a more intentional method using expanded and more current data to derive the default cut scores for MAP Growth performance.

¹ For a comprehensive description of the MAP Growth linking studies, please refer to Hu (2021).

2. Methodology

The default cut scores were derived from the median RIT cut scores from NWEA linking studies that were in active use as of August 2021 for reading and mathematics in Grades 3–8 based on the 2020 norms. An *actively used linking study* is one whose results were being applied to state-specific NWEA reports at the time of analysis. Table 2.1 presents the states included and the number of test events by subject and grade included in their linking study. As shown in the table, 37 states had results for reading and 39 states had results for mathematics. These eligible linking studies were conducted based on test events from Spring 2017 to Spring 2019. Most sample sizes for each subject and grade were above the minimum 1,000 test event requirement.

To derive the default cut scores, the cut scores for the *Proficient* and *Advanced* performance levels by subject and grade were compiled for each of the 39 states. Although states often had different naming conventions for their performance levels, the levels associated with proficiency status and above on the state summative test were used. The median RIT scores were calculated across states for each subject and grade and were then converted to percentiles based on the 2020 norms.

Given that the estimated RIT scores contain measurement error, the confidence interval for the median RIT scores were constructed based on 2 standard errors of measurement (SEMs). SEM is an estimate of the amount of measurement error in an observed test score, or a measure of score precision. It represents the amount of variability that can be expected in a test score due to the inherent imprecision of the test (e.g., if a student were tested again, they would likely obtain a slightly different score within this margin of error). The SEM values of 3.5 for reading and 2.9 for mathematics were applied, which approximate the average SEM across grades for each subject based on results from the 2019 MAP Growth technical report (NWEA, 2019, pp. 85–86). For example, if the RIT score for a reading test is 200, the lower and upper bounds of its confidence interval within 2 SEM are 193 ($200 - 2 \times 3.5 = 193$) and 207 ($200 + 2 \times 3.5 = 207$). These bounds show the range of cut scores that is within the margin of error expected for the median value. The bounds and median RIT scores were also converted to percentiles from the 2020 norms.

Table 2.1. Study Sample

State	Testing Term	#Test Events by Grade in Each Linking Study											
		Reading						Mathematics					
		3	4	5	6	7	8	3	4	5	6	7	8
AK	Spring 2017	3,342	3,418	6,411	6,028	5,803	5,512	3,358	3,415	6,399	6,038	5,790	5,488
AR	Spring 2018	4,081	3,887	4,092	3,828	3,439	2,199	4,078	3,985	4,078	3,482	3,475	2,268
AZ	Spring 2019	2,726	2,687	2,772	2,736	2,389	2,099	2,725	2,690	2,773	2,892	2,513	1,998
CO	Spring 2018	3,514	4,676	4,423	4,436	4,144	3,152	4,523	4,641	4,767	4,738	4,293	3,484
FL	Spring 2018	14,081	11,970	11,218	7,608	6,397	5,443	13,014	11,996	11,153	7,436	5,499	3,657
GA	Spring 2019	12,930	14,537	13,826	14,545	11,764	10,106	12,877	14,652	13,837	14,776	11,828	9,964
IA	Spring 2019	1,273	1,449	2,494	2,620	2,698	2,853	1,270	1,313	2,361	2,606	2,689	2,850
IL	Spring 2019	34,780	35,430	36,207	36,569	34,537	33,549	34,226	34,722	35,764	36,373	34,208	33,242
IN	Spring 2019	40,699	41,109	41,928	41,224	40,209	38,868	40,103	40,457	41,410	40,638	40,047	38,438
KS	Spring 2019	3,325	3,358	3,449	3,522	3,474	3,211	3,332	3,325	3,328	3,558	3,503	3,169
KY	Spring 2014	9,619	10,165	10,013	10,440	10,283	10,038	9,635	10,164	10,011	10,449	10,312	10,004
MA	Spring 2017	2,389	2,650	2,516	2,045	1,414	1,218	2,649	2,858	2,835	2,436	1,381	1,172
MI	Spring 2019	7,503	7,636	7,653	8,031	6,860	5,733	7,528	7,702	7,633	8,057	6,903	5,483
MN	Spring 2019	5,033	5,106	5,188	6,097	4,479	3,389	4,981	5,036	5,396	5,621	4,072	3,355
MO	Spring 2018	2,697	2,663	2,467	2,547	2,280	1,770	2,742	2,765	2,645	2,783	2,556	1,832
MS	Spring 2018	1,403	1,314	1,407	1,265	1,244	1,242	1,430	1,351	1,431	1,307	1,248	1,262
NC	Spring 2019	–	–	–	–	–	–	15,269	15,857	15,825	14,958	14,255	9,011
ND	Spring 2019	1,029	1,058	1,121	1,081	1,043	1,001	1,038	1,060	1,103	1,084	1,056	990
NE	Spring 2019	15,096	15,228	15,122	14,167	14,771	14,223	15,062	15,077	15,215	14,288	14,122	13,829
NY	Spring 2018	6,328	6,477	6,202	6,075	5,481	5,187	6,468	6,565	6,358	6,281	5,413	4,449
OH	Spring 2017	13,746	13,419	13,127	12,013	11,191	11,219	13,268	12,945	12,609	11,351	10,360	8,628
OK	Spring 2017, 2018	4,064	3,795	3,577	3,290	2,667	3,009	4,056	3,793	3,544	3,310	2,664	3,065
PA	Spring 2019	2,982	3,262	3,300	2,913	2,712	2,618	2,690	3,033	2,924	2,719	2,723	2,671
SBAC*	Spring 2019	52,047	68,052	87,700	96,186	107,898	110,928	55,488	74,464	96,390	107,142	121,597	119,848
SC	Spring 2017	15,015	16,201	15,777	15,332	14,926	14,244	15,034	16,282	15,790	15,365	14,951	14,117
TN	Spring 2017	14,072	13,922	11,372	9,450	9,373	9,438	10,400	9,913	7,876	6,298	6,213	5,560
TX	Spring 2017	21,039	21,946	21,062	19,439	17,145	11,291	21,348	22,177	21,282	20,277	17,460	9,720
VA	Spring 2019	–	–	–	–	–	–	4,078	3,542	3,599	4,167	3,406	1,492
WI	Spring 2019	5,992	6,316	6,492	6,772	6,695	6,090	6,006	6,413	6,555	6,820	6,676	5,997

*SBAC states include CA, CT, DE, HI, ID, MT, NV, OR, SD, VT, and WA.

3. Results

3.1. Default Cut Scores

Table 3.1 presents the median RIT scores and the associated percentiles based on the 2020 norms that can be used to classify students into *Proficient* and *Advanced* performance levels on MAP Growth. It also presents the percentiles of the median RIT based on ± 2 SEM (i.e., SEM = 3.5 for reading and 2.9 for mathematics). These default cut scores are based on linking study results from 37 states for reading and 39 states for mathematics.

Overall, the percentiles associated with the median *Proficient* and *Advanced* RIT cut scores are substantially above the 40th and 70th percentiles, respectively, in every subject and grade. The SEM bounds further illustrate that the 40th and 70th percentiles are below even the lower bound of the margins of error. The reading *Proficient* cut scores are more clustered than mathematics, spanning just 3 percentile units compared to 10 percentile units for mathematics. The median *Advanced* cut scores for both subjects span 4 percentile units.

Table 3.1. MAP Growth Default Cut Scores and Associated Margin of Error

Grade	<i>Proficient</i>		<i>Advanced</i>		Percentiles Corresponding to Median RIT ± 2 SEM	
	Median RIT	Percentile*	Median RIT	Percentile*	<i>Proficient</i>	<i>Advanced</i>
Reading						
3	201	59	214	85	(57, 62)	(82, 88)
4	208	58	220	82	(55, 61)	(79, 85)
5	214	57	226	83	(54, 61)	(80, 85)
6	218	57	230	82	(54, 60)	(80, 84)
7	221	56	236	86	(53, 60)	(84, 88)
8	224	56	238	83	(52, 59)	(81, 85)
Mathematics						
3	202	53	214	82	(49, 56)	(79, 84)
4	213	56	226	84	(52, 60)	(81, 87)
5	224	62	237	86	(59, 66)	(84, 89)
6	227	59	240	84	(55, 63)	(81, 86)
7	232	61	246	85	(57, 65)	(82, 88)
8	237	63	252	86	(59, 67)	(83, 89)

*Percentiles based on the 2020 norms (Thum & Kuhfeld, 2020)

3.2. Variability in Percentiles

Percentiles are a nonlinear transformation of test scores. They are spread out in the tails of the score distribution and condensed in the middle of the score distribution. A difference of one RIT point in the tail of the distribution will have a larger difference in percentiles than a difference of one RIT point near the middle of the distribution. Given that the spread of percentiles is affected by the location of the RIT cut scores, the variability in percentiles was evaluated in this study.

Table 3.2 presents the range of percentiles across states (i.e., the number of percentile units between the lowest and highest percentile cut value across all states). Overall, estimates of *Proficient* cut scores vary substantially across states, and most dramatically for mathematics. *Advanced* cut scores for both subjects show less spread. For example, the Grade 8 *Advanced* reading cut scores span 20 percentile units apart across states compared to the Grade 8 *Proficient* reading cut scores that span 44 percentile units. These results illustrate the variability of cut scores across states and caution partners against using the default cut scores for predictive purposes on their summative assessment.

Table 3.2. Percentile Ranges Across States

Grade	Percentile Range Across States			
	Reading		Mathematics	
	<i>Proficient</i>	<i>Advanced</i>	<i>Proficient</i>	<i>Advanced</i>
3	28	20	43	21
4	31	22	48	21
5	37	21	49	21
6	33	18	46	23
7	37	19	44	20
8	44	20	44	19

The appendices further depict the range of cut scores across states by subject, grade, and performance level, as summarized below.

- Appendix A presents the range of percentiles associated with the *Proficient* reading cut scores for the 37 states included in the study sample. Grade 8 has the greatest range of 44 percentile units, with the lowest proficient cut for a state at the 39th percentile (Iowa) and the highest proficient cut for a state at the 75th percentile (Kansas). California, Connecticut, Delaware, Iowa, and Pennsylvania generally have the lowest *Proficient* reading cut scores, while Illinois, Kansas, Oklahoma, South Carolina, and Tennessee have the highest.
- Appendix B presents the range of percentiles associated with the *Proficient* mathematics cut scores for the 39 states included in the study sample. Grade 5 shows the widest variability across states with a span of 49 percentile units, with the lowest proficient cut for a state at the 30th percentile (Iowa) and the highest proficient cut for a state at the 79th percentile (Illinois). Arkansas, Florida, Iowa, Ohio, North Carolina, and Virginia generally have the lowest *Proficient* mathematics cut scores, while Colorado, Illinois, Kansas, and Massachusetts generally have the highest.
- Appendix C presents the range of percentiles associated with the *Advanced* reading cut scores for the 37 states included in the study sample. Overall, the *Advanced* cut scores are less dispersed across states than the *Proficient* cut scores. For example, the Grade 8 *Proficient* reading cut scores span 44 percentile units, whereas the Grade 8 *Advanced* reading cut scores span 20 percentile units, from the 73rd percentile (Texas) to the 93rd percentile (Tennessee). California, Connecticut, Delaware, Hawaii, Missouri, and Washington generally have the lowest *Advanced* reading cut scores, while Illinois, Massachusetts, and Tennessee have the highest.

- Appendix D presents the range of percentiles associated with the *Advanced* mathematics cut scores for the 39 states included in the study sample. The same pattern found between the *Proficient* and *Advanced* reading cut scores is also evident for mathematics. Arkansas, California, Connecticut, and Washington generally have the lowest *Advanced* mathematics cut scores, while Alaska, Colorado, Illinois, Massachusetts, and Nebraska have the highest.

4. Conclusion and Discussion

The default cut scores from this study can be used by partners without their own linking study as an indication of student performance on MAP Growth relative to the performance standards set by MAP Growth users across states. To generate the new default cut scores that distinguish *Below Standards*, *Proficient* and *Advanced* performance levels in MAP Growth for reading and mathematics, quantitative and expert judgement were applied, which is often standard practice for identifying cut scores for an assessment.

First, all eligible linking study results from linking studies across 39 states were aggregated and synthesized. A group of NWEA experts deliberated on several approaches and reached a consensus that the default cut scores should be subject- and grade-specific (S. Tran, personal communication, January 19, 2022). This approach yields cut scores that reflect states' current designations of *Proficient* and *Advanced* performance and is empirically derived without any subjective judgments about the scores. It also reflects what is seen in real-world proficiency rates. For example, it meaningfully depicts that the Grade 3 performance level tends to be lower than what is seen in higher grades. Results from this study show that the 40th and 70th percentile cut values for the *Proficient* and *Advanced* performance levels for MAP Growth are too low for today's performance level standards.

It is important to note that the cut scores were not derived from the standard NWEA linking study process and should therefore not be applied the same way as results from a linking study. Notably, the default cut scores designate universal performance expectations on MAP Growth and should not be used to predict student performance on any summative assessment. One reason is because the underlying data in this study are not test events from a single assessment, but rather RIT cut scores from linking study results from various states with different content standards. As shown in the variability of percentiles across states, different states have different definitions of proficiency. The default cut score may under-predict proficiency in some states and over-predict proficiency in others. A partner-specific linking study is preferred for making predictions of performance levels on a specific summative assessment. Another limitation of the default cut scores is that classification accuracy statistics cannot be generated that reflect how well MAP Growth tests predict performance on a particular summative assessment. Finally, the default performance level definitions (*Below Standards*, *Proficient*, and *Advanced*) are not the same as those adopted for other assessments. They may have a different interpretation than performance levels set for a particular summative assessment.

Cut scores from partner-specific linking studies are therefore always preferred if the intention is to predict student proficiency on the end-of-grade or end-of-course summative tests. Partners should refer to their own linking study for RIT cut scores that directly correlate with their summative assessment and content standards. Those studies apply methods that ensure representativeness of the student population and provide classification accuracy statistics that indicate confidence in how well MAP Growth predicts proficiency on the summative test.

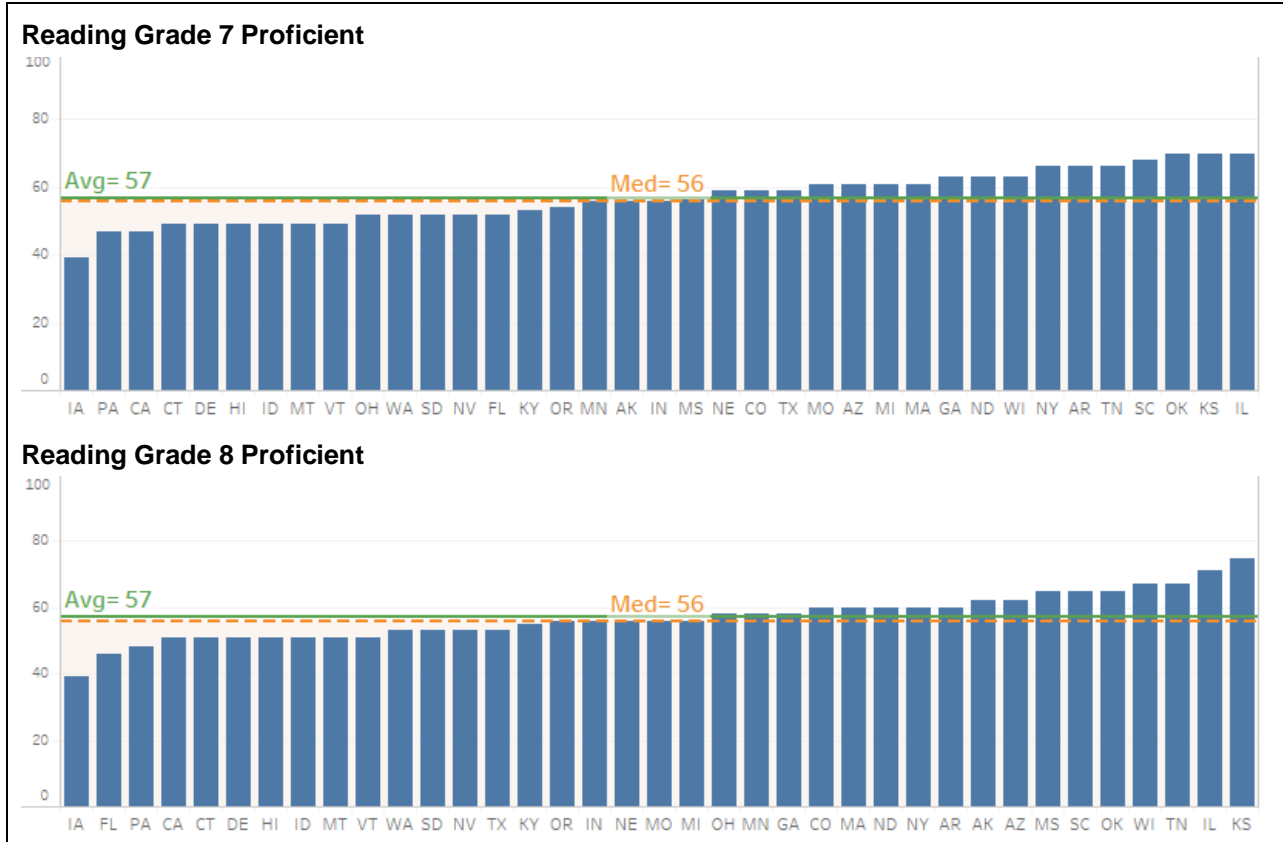
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Appendix A: Proficient Percentile Cuts by State—Reading

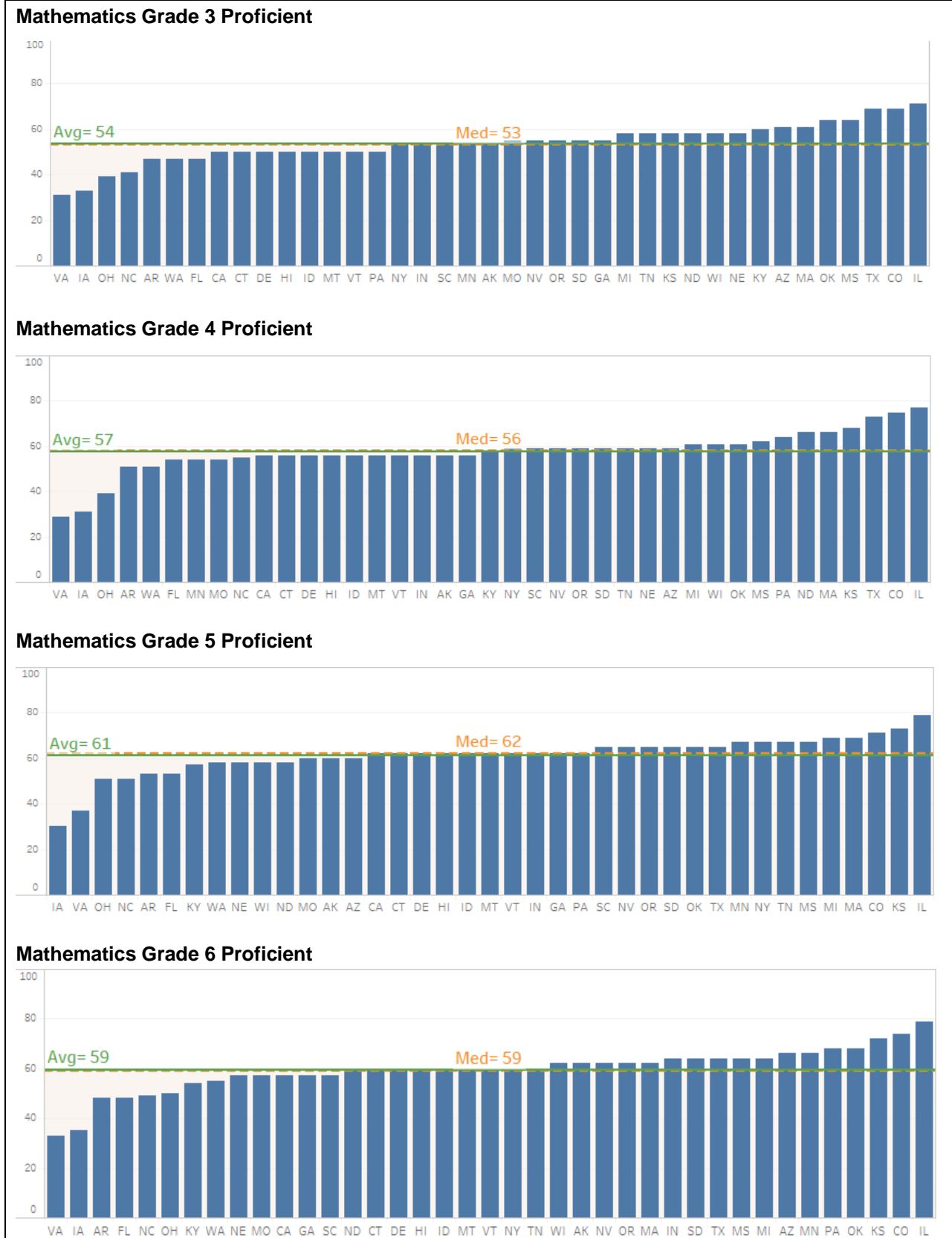


Appendix A: Proficient Percentile Cuts by State—Reading

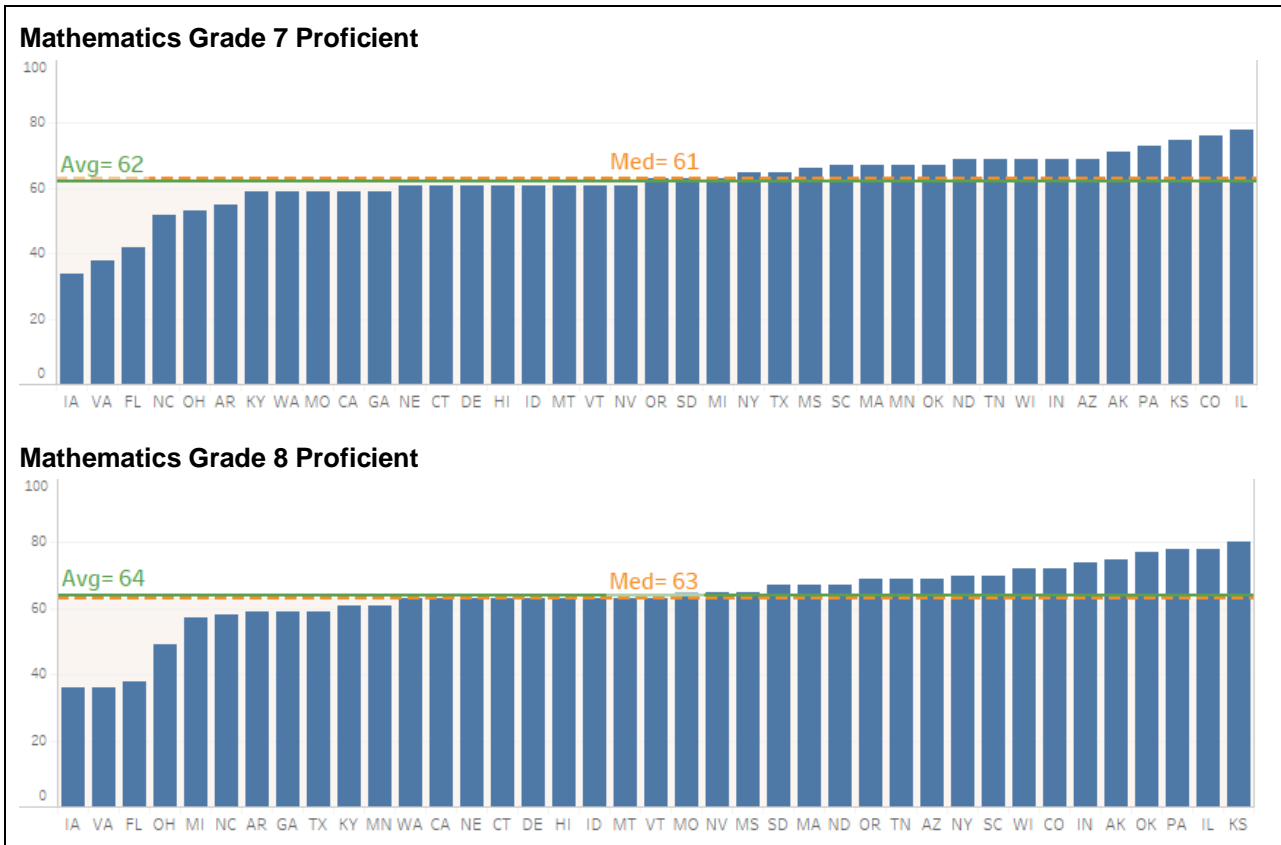


Avg = sample average. Med = sample median

Appendix B: Proficient Percentile Cuts by State—Mathematics

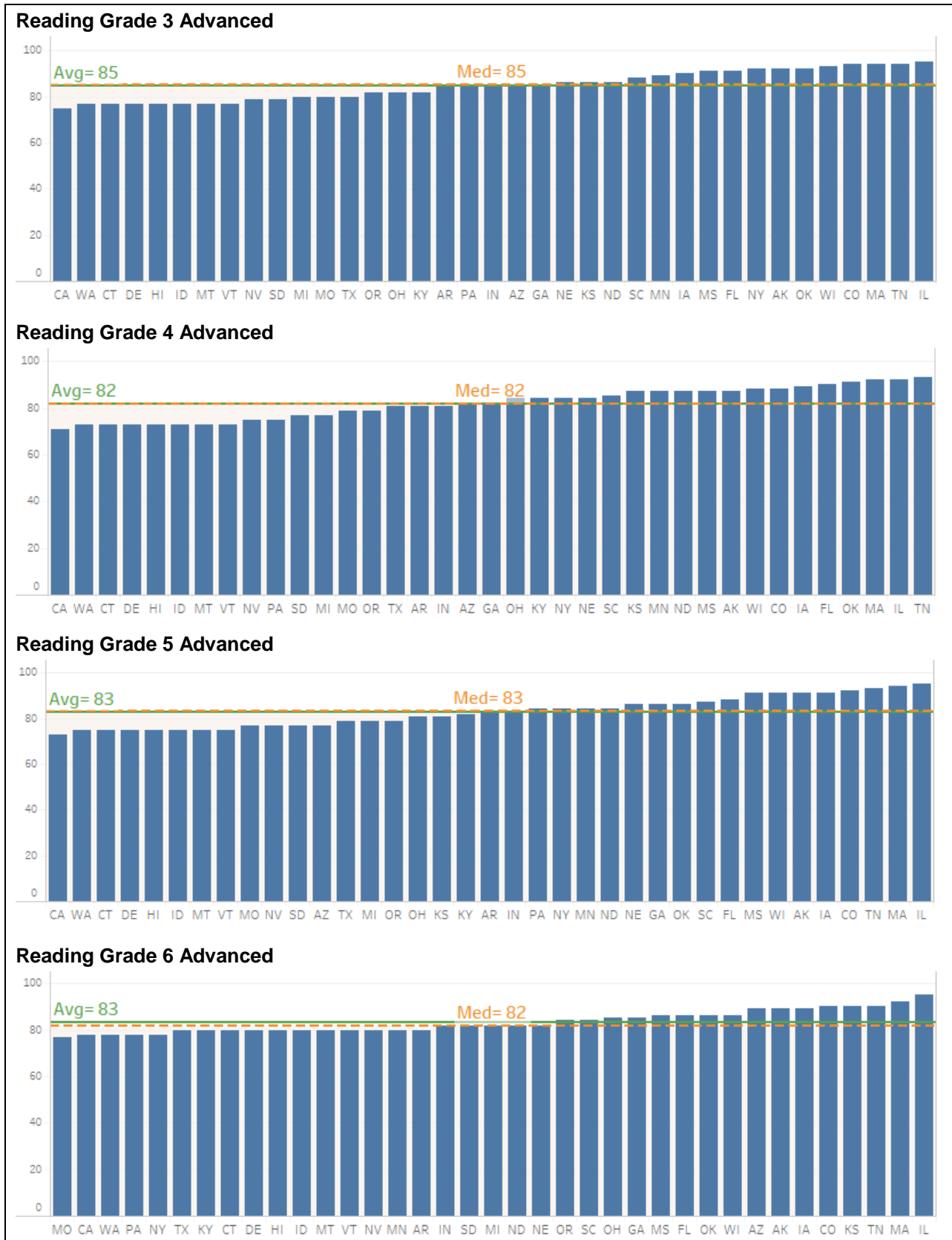


Appendix B: Proficient Percentile Cuts by State—Mathematics

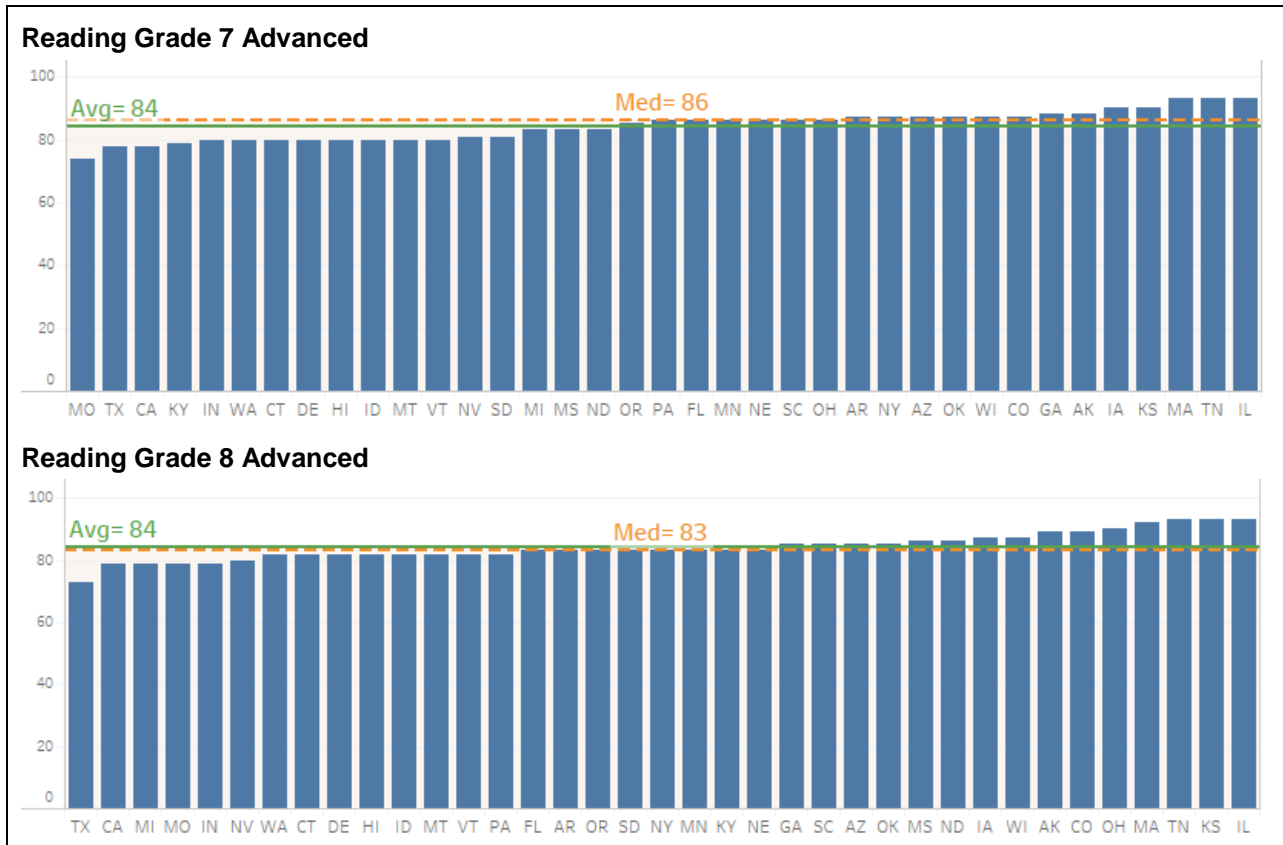


Avg = sample average. Med = sample median

Appendix C: Advanced Percentile Cuts by State—Reading

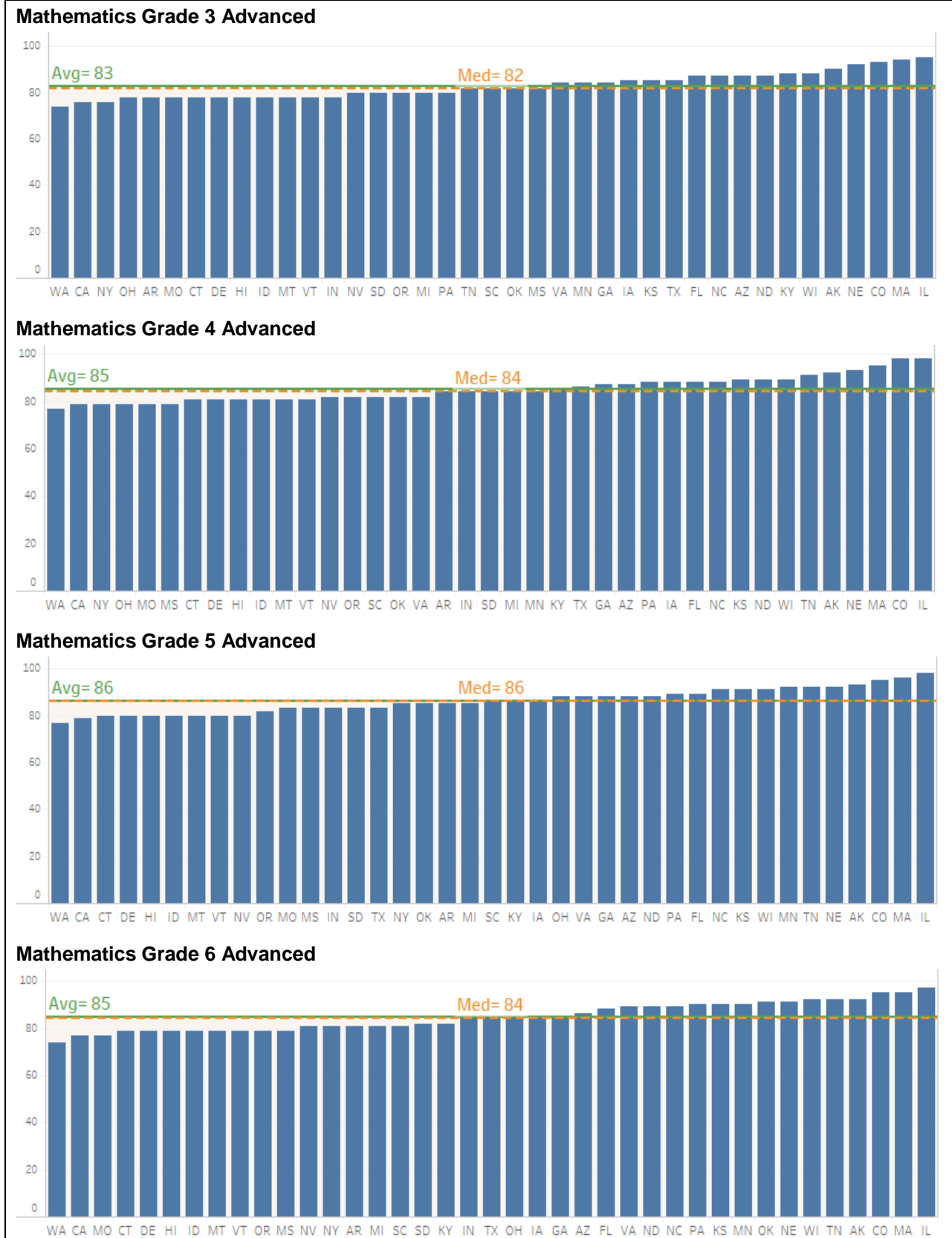


Appendix C: Advanced Percentile Cuts by State—Reading

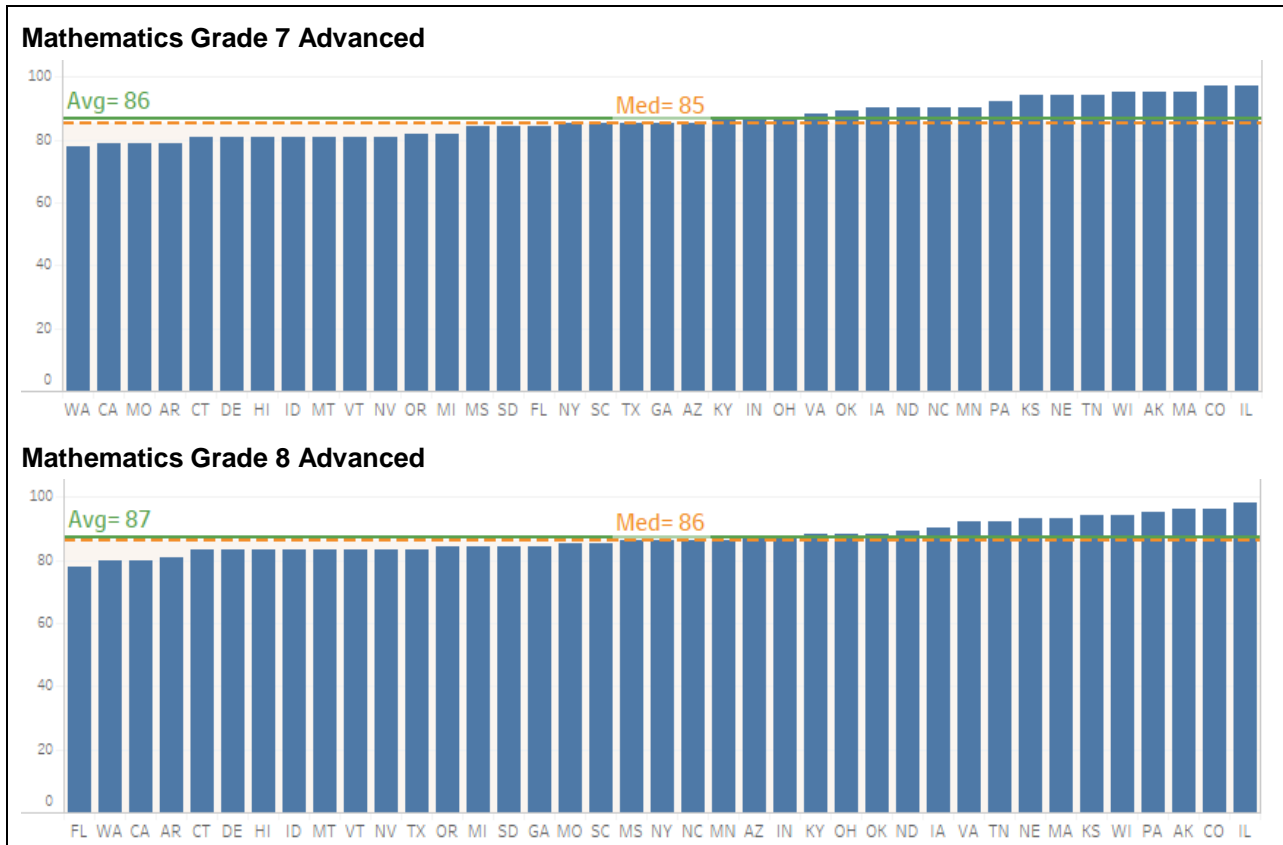


Avg = sample average. Med = sample median

Appendix D: Advanced Percentile Cuts by State—Mathematics



Appendix D: Advanced Percentile Cuts by State—Mathematics



Avg = sample average. Med = sample median