

**Data Analysis and Evaluation of the McGraw-Hill's  
*Reveal Math* Program, Its Implementation,  
and its Impact on Test Scores in an Arkansas District**

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## Executive Summary

The participating school district is located in Central Arkansas and uses two McGraw-Hill mathematics curricula in its public schools. *Reveal Math* is used in mathematics instruction for grades 7-12. The Auburn Center for Evaluation (ACE) was asked to analyze math test data for students using the program to answer an evaluation question. This addendum sought to answer the following question: *How does Year 2 growth compare to Year 1 growth for students who have been exposed to the Reveal Math curriculum for two years?* Since the district provided student identification numbers as part of the data they shared, it was possible for a descriptive, longitudinal analysis to be conducted.

## Key Findings

This addendum to the evaluation yielded three key findings:

1. Year 2 mean score growth was greater than Year 1 growth in every grade level.
2. Mean score growth was substantially better overall and for most subgroups in Year 2, when compared to Year 1 score growth.
3. Tenth grade Hispanic students demonstrated more than two years of learning in Year 2 of *Reveal Math* implementation.

## Limitations of the Evaluation

1. Data for the evaluation were completely dependent on the quality and quantity of information provided by the district.
2. Transience or mobility of the student population in participating schools is a concern. Only students with both fall and spring assessment scores were considered for these

analyses, and it is possible that they differ systematically from students who failed to take one of the assessments.

3. Intermediate and long-term shifts in knowledge, attitudes, perceptions, and achievements in math may not have resulted from the McGraw-Hill curricula alone. Many schools in Arkansas have multiple federal, state, and local initiatives in effect at the same time. Since many of these initiatives are aimed at improving academic achievement, this may or may not have had an impact on the assessment scores – or may have had less of an impact compared to other factors not accounted for in these analyses.
4. Interpretations based on statistical significance alone should be made with caution.
5. The 2020-21 school year took place during the COVID-19 pandemic and families were given the option of having their children attend school in one of three instructional options including: (1) in-person learning five days per week; (2) blended learning with two days per week of in-person learning; and (3) full-time remote learning. Differences in learning associated with the different learning modalities likely had a substantial impact on assessment scores, and that is not factored into these analyses.
6. Students who spent more time learning remotely experienced lower academic achievement compared to peers who spent more time learning in-person, and this was not factored into these analyses.

## **Data and Method**

As part of a larger evaluation effort, two evaluation questions were answered:

1. Do differences exist between Year 1 implementation (2020-2021) MAP growth scores and Year 2 implementation (2021-2022) MAP growth scores?

2. How do fall and spring MAP assessment scores compare to normative data for schools using the *Reveal Math* curriculum in the district?

The participating district is located in central Arkansas and serves more than 10,000 students. They use the McGraw-Hill *Reveal Math* curriculum for grades 7-12. Of interest was to learn whether students' MAP growth scores differed from Year 1 (2021-2021) to Year 2 (2021-2022) of the curriculum's implementation, as well as to learn how they compare with the Northwest Evaluation Association's (NWEA) normative data.

### **Data Sources and Analyses**

Data were provided by the district. The MAP assessments are administered three times annually in the school district. Fall and spring assessment scores were compared for this evaluation. The first evaluation question sought to learn if differences existed both within subjects (from fall to spring assessment), as well as between subjects (2020-2021 school year vs. 2021-2022 school year). As such, mixed analysis of variance (ANOVA) tests were conducted, and of interest was whether the interaction term findings were statistically and practically significant. A significant interaction term finding would indicate that there were differences in student growth from fall to spring across the two different school years. Partial eta-squared effect sizes are reported as a measure of practical significance (Salkind, 2017). Partial eta-squared values can be interpreted as follows:

- A small effect size is about .01
- A medium effect size is about .06
- A large effect size is about .16

Data were analyzed for grades 7 through 10. Students in the district do not consistently complete both the fall and spring MAP assessments in grades 11 and 12. The 2020-2021 and 2021-2022 data included data for race/ethnicity and gender subgroups. All data only reflect those test takers who completed both fall and spring assessments each year. Subgroups with fewer than 10 individuals were excluded from this report as an ethical consideration. Subgroups for students identified as *American Indian or Alaskan Native or Native Hawaiian or Other Pacific Islander* were not included in any of the analyses for this evaluation due to small sample sizes. These individuals are included in the overall grade-level statistics. Mixed ANOVAs were conducted using SPSS version 28.

### **COVID-19 Pandemic**

Data for the 2019-20 and 2020-21 school years were analyzed separately. Both school years took place during the ongoing COVID-19 pandemic and as such, the conditions under which the two school years occurred differed substantially – both from normal operation and from each other. The 2019-20 school year featured a significant disruption to learning when schools closed for in-person instruction in March 2020 as part of an effort to curb the spread of the virus (Marshall et al., 2020). Schools transitioned to emergency remote instruction for the remainder of the school year. As such, students entering the 2020-2021 school year did not receive a full typical years' worth of instruction during the prior school year.

The 2020-21 school year opened during the ongoing pandemic and school districts across the United States reopened with a range of instructional options for families (Marshall & Bradley-Dorsey, 2022). The district's reopening plan allowed families to choose between three instructional options: (1) traditional learning five days per week in person with half-days on

Wednesdays; (2) blended learning with two days per week of in-person instruction and three days of remote learning; and (3) full-time online learning. Students could transition between the three options at different times during the year. A student who attended remotely to begin the school year who transitioned to a blended learning option might have had a very different schooling experience than a student who was in-person for the duration of the school year. Early evidence suggests that students who engaged in remote learning for longer durations of time experienced reduced academic achievement during this historic time, compared with students who spent more time attending school in person (e.g., Halloran et al., 2021). It is imperative to view this evaluation's findings with these contextual factors in mind.

### **Comparison of Fall to Spring Growth Scores**

The first evaluation question sought to learn whether there were differences in student growth scores between Year 1 and Year 2 of the implementation of the *Reveal Math* curriculum in the district. NWEA MAP math assessment data were compared from the 2020-2021 and 2021-2022 school years in terms of growth from fall to spring assessment administrations. Significant results were found for each grade level evaluated. For each grade level tested, Year 2 fall assessment scores were lower than Year 1 scores. Students entered the 2021-2022 scoring lower than they did the year prior; this may be partly explained by the extent to which students opted for remote learning during Year 1 of implementation.

Despite having lower fall scores, students in Year 2 of *Reveal Math*'s implementation reported growth scores that outpaced student growth in Year 1. Seventh grade students in Year 2 (mean growth score=5.52) achieved significantly greater growth than seventh grade students in Year 1 (mean growth score=3.71),  $F(1, 1294)=14.34, p < .001$ . A partial  $\eta^2$  effect size of .011

suggests that this represents a significant, but small difference in scores. Eighth grade students in Year 2 (mean growth score=4.86) achieved significantly greater growth than eighth grade students in Year 1 (mean growth score=1.64),  $F(1, 1207)=37.08, p < .001$ . A partial  $\eta^2$  effect size of .030 suggests that this represents a significant, but small to medium sized difference in scores. Ninth grade students in Year 2 (mean growth score=3.52) outpaced ninth grade students in Year 1 (mean growth score=0.17),  $F(1, 1378)=42.42, p < .001$ . A partial  $\eta^2$  effect size of .030 suggests that this represents a significant, but small to medium sized difference in scores. Tenth grade students in Year 1 experienced nearly flat growth (mean growth score=0.14). Year 2 tenth grade students experienced significantly more growth (mean growth score=3.17),  $F(1,1170)=25.99, p < .001$ . A partial  $\eta^2$  effect size of .022 suggests that this represents a significant, but small difference in scores. See Table 1 for means, standard deviations,  $p$ -values, and effect sizes. See Appendices A-D for graphical depictions of student growth across years from fall to spring assessment administrations.

Table 1. – *Fall to Spring Mixed ANOVA Findings*

	Fall			Spring		F	<i>p</i> -value	Partial $\eta^2$
	N	M	SD	M	SD			
<b>7<sup>th</sup> Grade</b>								
2020-2021	609	213.04	15.97	216.75	19.63	14.34	<.001	.011
2021-2022	687	212.04	17.19	217.56	16.92			
<b>8<sup>th</sup> Grade</b>								
2020-2021	598	221.95	16.40	223.59	20.00	37.08	<.001	.030
2021-2022	611	214.57	17.34	219.43	17.13			
<b>9<sup>th</sup> Grade</b>								
2020-2021	590	223.94	18.73	224.11	21.35	42.42	<.001	.030
2021-2022	790	221.14	17.33	224.66	17.89			
<b>10<sup>th</sup> Grade</b>								
2020-2021	489	229.16	19.22	229.30	22.71	25.99	<.001	.022
2021-2022	683	223.44	19.34	226.61	20.12			

*Note: F, p, and partial  $\eta^2$  values are for the test administration x year interaction term. Only students who completed both assessments in a given year were included in these analyses.*

### **Comparison with Normative Data**

The fall and spring assessment scores were also compared with MAP's normative data. Data were compared with the 2020 normative data (NWEA, 2020a). Subgroup data for race/ethnicity and gender are presented. Student growth is also presented in terms of months of learning that occurred during the school year, based on the NWEA normed growth data (NWEA, 2020a). The assessments assume that six months of learning takes place between the fall and spring assessment administrations. As such, values greater than six indicate that additional learning has taken place; values less than six months indicate that students did not learn as much as the median student in the United States would have been expected to learn. Months of learning are calculated by dividing observed growth values by normed growth values, and then multiplying by six (NWEA, 2020b). All analyses performed using Stata version 17.

### **Seventh Grade**

The fall and spring means for students in both academic years were below the normed data overall, and for each subgroup, with Asian students as the lone exception – although it is worth noting the small sample size for this subgroup ( $n=12$ ). Student growth was above the normed data for Asian students only, during Year 1 (mean score growth=8.41). Growth was more than a standard deviation below the normed data for Year 1 overall (mean score growth=3.71), as well as for all but one subgroup. Year 2 score growth was better overall, as well as for every subgroup with the exception of more than one race, which was comparable (Year 1 growth=5.29 vs. Year 2 growth=5.15). See Table 2 for descriptive statistics and Table 3 for a comparison with normed data for second grade students.

### **Eighth Grade**

The fall means for students in both academic years were below the normed data overall, as well as for each subgroup except for Asian and White students. The same was true for spring mean scores, except for Asian students. Again, it is worth noting the small sample size for this subgroup (n=13). Year 1 student growth was more than one standard deviation below the normed data, except for Hispanic (mean score growth=5.17) and Asian students (mean score growth=8.41). Year 2 score growth was stronger than in Year 1, and almost all Year 2 subgroups outperformed Year 1 score means. White students, students of more than one race, and males reported score growth above the normed data. See Table 4 for descriptive statistics and Table 5 for a comparison with normed data for third grade students.

### **Ninth Grade**

The fall and spring means for students in both academic years were below the normed data overall, with White students (both years) and Asian students (Year 2) as exceptions. In terms of Year 1 score growth, only female students were less than one standard deviation below the normed data, and their growth was equal to less than half of a school year (2.80 months of learning). In Year 2, score growth was markedly improved overall and for every subgroup. Asian (mean score growth= 3.60), White (mean score growth=3.65), and male students (mean score growth=3.79) all posted growth above the normed data. See Table 6 for descriptive statistics and Table 7 for a comparison with normed data for fifth grade students.

### **Tenth Grade**

The fall means for students in Year 2 were below those in Year 1 both overall and for each subgroup. This is likely the result alternate learning modalities during the pandemic. Year 2 mean score growth was substantially improved compared to Year 1. Hispanic students' mean score growth was equal to 9.26 months of learning, or an additional three months of learning. See Table 8 for descriptive statistics and Table 9 for a comparison with normed data for fifth grade students.

Table 2. – 2020-2021 and 2021-2022 MAP Scores Descriptive Data – Grade 7

	Year	N	Fall Mean	Fall SD	Spring Mean	Spring SD
<b>All Students</b>	2020-21	752	213.04	15.97	216.75	19.63
	2021-22	687	212.04	17.19	217.56	16.92
<b>Asian</b>	2020-21	12	231.67	15.32	240.08	21.02
	2021-22	**	**	**	**	**
<b>Black</b>	2020-21	261	208.74	14.90	211.47	18.42
	2021-22	339	207.46	15.08	212.68	14.62
<b>Hispanic</b>	2020-21	71	208.58	16.30	213.75	17.29
	2021-22	74	209.92	20.80	216.22	18.87
<b>White</b>	2020-21	243	218.02	14.87	221.97	19.35
	2021-22	237	217.65	16.66	223.48	16.98
<b>More than one race</b>	2020-21	21	214.71	16.47	220.00	19.48
	2021-22	28	219.71	17.01	224.86	16.98
<b>Female</b>	2020-21	282	213.54	15.43	217.60	18.66
	2021-22	324	213.87	15.12	218.83	15.53
<b>Male</b>	2020-21	327	212.62	16.43	216.02	20.42
	2021-22	363	210.04	18.72	216.43	18.02

Note: \*\* Fewer than 10 students in this group; Fall and spring scores reflect mean scores overall and for each subgroup

Table 3. – 2020-2021 and 2021-2022 MAP Scores Compared with Normative Data – Grade 7

	Year	N	Fall Normed	Fall Mean	Spring Normed	Spring Mean	Growth Normed	Growth Mean	Months of Learning
<b>All Students</b>	2020-21	752	220.21	213.04	226.73	216.75	6.52	3.71	3.41
	2021-22	687		212.04		217.56		5.52	
<b>Asian</b>	2020-21	12	220.21	231.67	226.73	240.08	6.52	8.41	7.74
	2021-22	**		**		**		**	
<b>Black</b>	2020-21	261	220.21	208.74	226.73	211.47	6.52	2.73	2.51
	2021-22	339		207.46		212.68		5.22	
<b>Hispanic</b>	2020-21	71	220.21	208.58	226.73	213.75	6.52	5.17	4.76
	2021-22	74		209.92		216.22		6.30	
<b>White</b>	2020-21	243	220.21	218.02	226.73	221.97	6.52	3.95	3.63
	2021-22	237		217.65		223.48		5.83	
<b>More than one race</b>	2020-21	21	220.21	214.71	226.73	220.00	6.52	5.29	4.87
	2021-22	28		219.71		224.86		5.15	
<b>Female</b>	2020-21	282	220.21	213.54	226.73	217.60	6.52	4.06	3.74
	2021-22	324		213.87		218.83		4.96	
<b>Male</b>	2020-21	327	220.21	212.62	226.73	216.02	6.52	3.40	3.13
	2021-22	364		210.04		216.43		6.39	
<b>KEY</b>	More than 1 SD below Norm			Less than 1 SD below Norm		Above norm by less than 1 SD		Above norm by more than 1 SD	

Note: \*\* Fewer than 10 students in this group; Fall and spring scores reflect mean scores overall and for each subgroup.

Table 4. – 2020-2021 and 2021-2022 MAP Scores Descriptive Data – Grade 8

	<b>Year</b>	<b>N</b>	<b>Fall Mean</b>	<b>Fall SD</b>	<b>Spring Mean</b>	<b>Spring SD</b>
<b>All Students</b>	2020-21	598	221.95	16.40	223.59	20.00
	2021-22	611	214.57	17.34	219.43	17.13
<b>Asian</b>	2020-21	13	235.23	13.00	239.62	16.48
	2021-22	**	**	**	**	**
<b>Black</b>	2020-21	246	216.70	15.35	218.42	18.75
	2021-22	307	210.77	16.23	214.95	15.39
<b>Hispanic</b>	2020-21	65	219.68	15.24	224.82	16.29
	2021-22	68	214.12	16.08	218.24	16.26
<b>White</b>	2020-21	256	227.04	15.83	227.80	20.64
	2021-22	203	219.70	18.63	225.71	17.23
<b>More than one race</b>	2020-21	16	220.00	18.70	218.50	22.50
	2021-22	24	217.08	18.63	223.17	15.89
<b>Female</b>	2020-21	320	222.97	15.76	225.77	18.08
	2021-22	294	215.75	17.06	220.01	17.62
<b>Male</b>	2020-21	278	220.77	17.06	221.09	21.77
	2021-22	317	213.48	17.54	218.90	16.67

Note: \*\* Fewer than 10 students in this group; Fall and spring scores reflect mean scores overall and for each subgroup

Table 5. – 2020-2021 and 2021-2022 MAP Scores Compared with Normative Data – Grade 8

	Year	N	Fall Normed	Fall Mean	Spring Normed	Spring Mean	Growth Normed	Growth Mean	Months of Learning
<b>All Students</b>	2020-21	598	224.92	221.95	230.30	223.59	5.38	1.64	1.83
	2021-22	611		214.57		219.43		4.86	5.42
<b>Asian</b>	2020-21	13	224.92	235.23	230.30	239.62	5.38	4.39	4.90
	2021-22	**		**		**		**	**
<b>Black</b>	2020-21	246	224.92	216.70	230.30	218.42	5.38	1.72	1.92
	2021-22	307		210.77		214.95		4.18	4.66
<b>Hispanic</b>	2020-21	65	224.92	219.68	230.30	224.82	5.38	5.14	5.73
	2021-22	68		214.12		218.24		4.12	4.59
<b>White</b>	2020-21	256	224.92	227.04	230.30	227.80	5.38	0.76	0.85
	2021-22	203		219.70		225.71		6.01	6.70
<b>More than one race</b>	2020-21	16	224.92	220.00	230.30	218.50	5.38	-1.50	***
	2021-22	24		217.08		223.17		6.09	6.79
<b>Female</b>	2020-21	320	224.92	222.97	230.30	225.77	5.38	2.80	3.12
	2021-22	294		215.75		220.01		4.26	4.75
<b>Male</b>	2020-21	278	224.92	220.77	230.30	221.09	5.38	0.32	0.36
	2021-22	317		213.48		218.90		5.42	6.04
<b>KEY</b>			More than 1 SD below Norm	Less than 1 SD below Norm		Above norm by less than 1 SD		Above norm by more than 1 SD	

Note: \*\* Fewer than 10 students in this group; \*\*\* Months of learning was not calculated for subgroups that experienced negative growth. Fall and spring scores reflect mean scores overall and for each subgroup.

Table 6. – 2020-2021 and 2021-2022 MAP Scores Descriptive Data – Grade 9

	Year	N	Fall Mean	Fall SD	Spring Mean	Spring SD
<b>All Students</b>	2020-21	590	223.94	18.73	224.11	21.35
	2021-22	790	221.14	17.33	224.66	17.89
<b>Asian</b>	2020-21	**	**	**	**	**
	2021-22	10	227.20	15.85	230.80	14.98
<b>Black</b>	2020-21	264	218.41	18.13	218.45	19.61
	2021-22	388	216.27	15.78	219.65	15.97
<b>Hispanic</b>	2020-21	41	223.61	18.13	224.49	20.29
	2021-22	78	223.23	16.99	226.76	16.83
<b>White</b>	2020-21	253	229.61	18.17	229.89	21.89
	2021-22	284	227.26	17.11	230.91	18.55
<b>More than one race</b>	2020-21	19	222.37	20.04	222.00	23.69
	2021-22	29	217.90	20.73	221.72	19.12
<b>Female</b>	2020-21	295	224.75	17.31	226.43	20.10
	2021-22	412	221.06	16.56	224.34	17.48
<b>Male</b>	2020-21	295	223.13	20.05	221.78	22.32
	2021-22	378	221.22	18.15	225.01	18.34

Note: \*\* Fewer than 10 students in this group; Fall and spring scores reflect mean scores overall and for each subgroup

Table 7. – 2020-2021 and 2021-2022 MAP Scores Compared with Normative Data – Grade 9

	Year	N	Fall Normed	Fall Mean	Spring Normed	Spring Mean	Growth Normed	Growth Mean	Months of Learning
<b>All Students</b>	2020-21	590	226.43	223.94	230.03	224.11	3.60	0.17	0.28
	2021-22	790		221.14		224.66		3.52	5.87
<b>Asian</b>	2020-21	**	226.43	**	230.03	**	3.60	**	**
	2021-22	10		227.20		230.80		3.60	6.00
<b>Black</b>	2020-21	264	226.43	218.41	230.03	218.45	3.60	0.04	0.07
	2021-22	388		216.27		219.65		3.38	5.63
<b>Hispanic</b>	2020-21	41	226.43	223.61	230.03	224.49	3.60	0.88	1.47
	2021-22	78		223.23		226.76		3.53	5.88
<b>White</b>	2020-21	253	226.43	229.61	230.03	229.89	3.60	0.28	0.47
	2021-22	284		227.26		230.91		3.65	6.08
<b>More than one race</b>	2020-21	19	226.43	222.37	230.03	222.00	3.60	-0.37	***
	2021-22	29		217.90		221.72		3.82	6.37
<b>Female</b>	2020-21	295	226.43	224.75	230.03	226.43	3.60	1.68	2.80
	2021-22	412		221.06		224.34		3.28	5.47
<b>Male</b>	2020-21	295	226.43	223.13	230.03	221.78	3.60	-1.35	***
	2021-22	378		221.22		225.01		3.79	6.32
<b>KEY</b>			More than 1 SD below Norm	Less than 1 SD below Norm		Above norm by less than 1 SD		Above norm by more than 1 SD	

Note: \*\* Fewer than 10 students in this group; \*\*\* Months of learning was not calculated for subgroups that experienced negative growth. Fall and spring scores reflect mean scores overall and for each subgroup.

Table 4. – 2020-2021 and 2021-2022 MAP Scores Descriptive Data – Grade 10

	<b>Year</b>	<b>N</b>	<b>Fall Mean</b>	<b>Fall SD</b>	<b>Spring Mean</b>	<b>Spring SD</b>
<b>All Students</b>	2020-21	489	229.16	19.22	229.30	22.71
	2021-22	683	223.44	19.34	226.61	21.61
<b>Asian</b>	2020-21	**	**	**	**	**
	2021-22	12	237.58	12.72	239.83	18.39
<b>Black</b>	2020-21	219	223.16	18.03	222.87	21.86
	2021-22	314	216.46	18.31	219.30	18.35
<b>Hispanic</b>	2020-21	25	225.88	16.99	227.36	19.02
	2021-22	56	223.46	21.52	228.63	21.90
<b>White</b>	2020-21	219	235.15	18.38	235.47	21.86
	2021-22	281	230.71	17.31	233.94	18.72
<b>More than one race</b>	2020-21	15	226.60	16.97	223.93	21.86
	2021-22	17	221.35	19.35	224.41	21.71
<b>Female</b>	2020-21	271	231.21	18.71	232.49	22.53
	2021-22	317	223.78	17.66	226.80	18.28
<b>Male</b>	2020-21	218	226.62	19.58	225.33	22.35
	2021-22	366	223.14	20.71	226.44	21.61

Note: \*\* Fewer than 10 students in this group; Fall and spring scores reflect mean scores overall and for each subgroup

Table 3. – 2020-2021 and 2021-2022 MAP Scores Compared with Normative Data – Grade 10

	Year	N	Fall Normed	Fall Mean	Spring Normed	Spring Mean	Growth Normed	Growth Mean	Months of Learning
<b>All Students</b>	2020-21	489	229.07	229.16	232.42	229.30	3.35	0.14	0.25
	2021-22	683		223.44		226.61		3.17	
<b>Asian</b>	2020-21	**	229.07	**	232.42	**	3.35	**	**
	2021-22	12		237.58		239.83		2.25	
<b>Black</b>	2020-21	219	229.07	223.16	232.42	222.87	3.35	-0.29	***
	2021-22	314		216.46		219.30		2.84	
<b>Hispanic</b>	2020-21	25	229.07	225.88	232.42	227.36	3.35	1.48	2.65
	2021-22	56		223.46		228.63		5.17	
<b>White</b>	2020-21	219	229.07	235.15	232.42	235.47	3.35	0.32	0.57
	2021-22	281		230.71		233.94		3.23	
<b>More than one race</b>	2020-21	15	229.07	226.60	232.42	223.93	3.35	-2.67	***
	2021-22	17		221.35		224.41		3.06	
<b>Female</b>	2020-21	271	229.07	231.21	232.42	232.49	3.35	1.28	0.38
	2021-22	317		223.78		226.80		3.02	
<b>Male</b>	2020-21	218	229.07	226.62	232.42	225.33	3.35	-1.29	***
	2021-22	366		223.14		226.44		3.30	
<b>KEY</b>			More than 1 SD below Norm	Less than 1 SD below Norm		Above norm by less than 1 SD		Above norm by more than 1 SD	

Note: \*\* Fewer than 10 students in this group; Fall and spring scores reflect mean scores overall and for each subgroup.

### **Growth from Grade 6 to Grade 7**

Student growth on the NWEA assessments were compared for all students who were enrolled in the 6<sup>th</sup> grade in 2020-2021 and 7<sup>th</sup> grade in 2021-2022. There were 415 students enrolled in district schools for both grade levels who also took all four assessments (Fall 2020, Spring 2021, Fall 2021, and Spring 2022). Students overall and across subgroups performed below the NWEA normed data. However, with the exception of students of more than one race/ethnicity group and females, students' growth was greater during the second year of exposure to the *Reveal Math* curriculum. See Table 1 for means, standard deviations, and growth (in points and in terms of months of learning).

Table 1. – *Growth from 6<sup>th</sup> Grade (2020-2021) to 7<sup>th</sup> Grade (2021-2022)*

	Fall			Spring		Growth	Mos. of Learning
	N	M	SD	M	SD		
<b>Overall</b>							
2020-2021	415	208.17	13.91	213.16	18.02	4.99	3.68
2021-2022	415	214.04	17.35	219.15	17.29	4.86	4.47
<b>Males</b>							
2020-2021	217	207.45	14.93	212.24	19.68	4.79	3.54
2021-2022	217	212.96	19.27	218.31	18.89	5.35	4.92
<b>Females</b>							
2020-2021	198	208.97	12.68	214.18	15.98	6.01	4.44
2021-2022	198	215.23	14.93	220.08	15.35	4.85	4.46
<b>Black</b>							
2020-2021	174	204.46	12.68	208.37	16.77	3.91	2.89
2021-2022	174	209.58	15.39	214.48	14.74	4.90	4.51
<b>Hispanic</b>							
2020-2021	50	206.66	15.15	210.70	19.74	4.04	2.92
2021-2022	50	212.18	19.25	217.28	17.97	5.10	4.69
<b>White</b>							
2020-2021	163	211.48	13.95	217.73	17.80	6.25	4.61
2021-2022	163	217.69	17.79	223.17	18.38	5.48	5.04
<b>More than one race</b>							
2020-2021	21	214.24	12.43	220.38	15.15	6.14	4.53
2021-2022	21	222.57	14.86	227.14	16.12	4.57	4.21

*Note: Only students who completed both assessments for both years were included in these analyses.*

### **Growth from Grade 7 to Grade 8**

Student growth on the NWEA assessments were compared for all students who were enrolled in the 7<sup>th</sup> grade in 2020-2021 and 8<sup>th</sup> grade in 2021-2022. There were 395 students enrolled in district schools for both grade levels who also took all four assessments (Fall 2020, Spring 2021, Fall 2021, and Spring 2022). Students overall and across subgroups performed below the NWEA normed data. Students of more than one race/ethnicity group and White students were exceptions. Both overall and across subgroups, students' growth was greater

during the second year of exposure to the *Reveal Math* curriculum. See Table 2 for means, standard deviations, and growth (in points and in terms of months of learning).

Table 2. – *Growth from 7<sup>th</sup> Grade (2020-2021) to 8<sup>th</sup> Grade (2021-2022)*

	Fall			Spring		Growth	Mos. of Learning
	N	M	SD	M	SD		
<b>Overall</b>							
2020-2021	395	210.09	14.81	213.46	17.71	3.37	3.10
2021-2022	395	214.61	16.78	219.67	16.33	5.06	5.64
<b>Males</b>							
2020-2021	214	209.46	15.27	212.39	18.72	2.93	2.70
2021-2022	214	213.93	17.33	219.78	16.02	5.85	6.52
<b>Females</b>							
2020-2021	181	210.83	14.25	214.72	16.39	3.89	3.58
2021-2022	181	215.41	16.10	219.55	16.75	4.14	4.62
<b>Black</b>							
2020-2021	188	206.79	14.19	209.69	17.24	2.90	2.69
2021-2022	188	211.30	15.54	215.32	14.79	4.02	4.48
<b>Hispanic</b>							
2020-2021	49	208.35	15.99	213.41	16.32	5.06	4.66
2021-2022	49	213.88	16.47	219.02	16.27	5.14	5.73
<b>White</b>							
2020-2021	135	214.70	13.47	217.73	17.26	3.03	2.79
2021-2022	135	218.90	16.92	225.11	16.12	6.21	6.93
<b>More than one race</b>							
2020-2021	18	212.06	15.81	217.39	18.91	5.33	4.90
2021-2022	18	215.83	18.79	222.89	15.48	7.06	7.87

*Note: Only students who completed both assessments for both years were included in these analyses.*

### Growth from Grade 8 to Grade 9

Student growth on the NWEA assessments were compared for all students who were enrolled in the 8<sup>th</sup> grade in 2020-2021 and 9<sup>th</sup> grade in 2021-2022. There were 428 students enrolled in district schools for both grade levels who also took all four assessments (Fall 2020, Spring 2021, Fall 2021, and Spring 2022). In Year 2, students performed either at or above the NWEA normed data in terms of fall-to-spring growth. Overall, students' Year 2 growth scores

represented more than twice the amount of learning that occurred in Year 1. This was also true for males, Black students, White students, and students of more than one race/ethnicity group. See Table 3 for means, standard deviations, and growth (in points and in terms of months of learning).

Table 3. – *Growth from 8<sup>th</sup> Grade (2020-2021) to 9<sup>th</sup> Grade (2021-2022)*

	Fall			Spring		Growth	Mos. of Learning
	N	M	SD	M	SD		
<b>Overall</b>							
2020-2021	428	221.57	16.17	223.71	19.00	2.14	2.39
2021-2022	428	223.95	17.18	228.06	16.33	4.11	6.85
<b>Males</b>							
2020-2021	199	220.69	16.47	221.66	20.63	0.97	1.08
2021-2022	199	222.97	18.15	227.67	17.74	4.70	7.83
<b>Females</b>							
2020-2021	229	222.36	15.90	225.49	17.30	3.13	3.49
2021-2022	229	224.81	16.28	228.39	16.70	3.58	5.97
<b>Black</b>							
2020-2021	191	217.40	15.10	219.20	16.09	1.80	2.01
2021-2022	191	218.72	16.09	222.77	15.70	4.05	6.75
<b>Hispanic</b>							
2020-2021	46	218.63	16.11	223.48	16.28	4.85	5.41
2021-2022	46	222.65	16.90	227.07	16.10	4.42	7.37
<b>White</b>							
2020-2021	169	226.75	15.89	228.79	18.81	2.04	2.28
2021-2022	169	230.34	16.29	234.27	17.10	3.93	6.55
<b>More than one race</b>							
2020-2021	13	219.77	19.00	217.46	23.70	-2.77	**
2021-2022	13	219.23	21.14	224.31	18.57	5.08	7.87

*Note: Only students who completed both assessments for both years were included in these analyses. \*\* Months of learning not calculated for negative growth.*

### Growth from Grade 9 to Grade 10

Student growth on the NWEA assessments were compared for all students who were enrolled in the 9<sup>th</sup> grade in 2020-2021 and 10<sup>th</sup> grade in 2021-2022. There were 464 students enrolled in district schools for both grade levels who also took all four assessments (Fall 2020,

Spring 2021, Fall 2021, and Spring 2022). In Year 2, students performed either at or above the NWEA normed data in terms of fall-to-spring growth. Both overall, and across all subgroups, students more than doubled their learning in Year 2. Hispanic students demonstrated learning equivalent to two years of learning in Year 2 of *Reveal Math*'s implementation. See Table 4 for means, standard deviations, and growth (in points and in terms of months of learning).

Table 4. – *Growth from 9<sup>th</sup> Grade (2020-2021) to 10<sup>th</sup> Grade (2021-2022)*

	N	Fall		Spring		Growth	Mos. of Learning
		M	SD	M	SD		
<b>Overall</b>							
2020-2021	464	224.94	18.54	224.97	21.46	0.03	0.05
2021-2022	464	224.96	18.90	228.15	19.90	3.19	5.71
<b>Males</b>							
2020-2021	237	224.51	20.08	223.32	22.93	-1.19	**
2021-2022	237	222.97	18.15	227.67	17.74	4.70	8.42
<b>Females</b>							
2020-2021	227	225.38	16.81	226.69	19.71	1.31	2.18
2021-2022	227	224.95	17.31	228.53	17.98	3.58	6.41
<b>Black</b>							
2020-2021	196	218.84	17.80	218.73	19.58	-0.11	**
2021-2022	196	218.10	17.35	220.69	18.00	2.59	4.64
<b>Hispanic</b>							
2020-2021	33	226.48	15.49	227.27	20.59	1.15	1.92
2021-2022	33	226.12	19.71	232.85	19.72	6.72	12.05
<b>White</b>							
2020-2021	213	230.11	17.99	230.19	18.18	0.08	2.28
2021-2022	213	231.15	18.18	234.41	19.28	3.26	5.84
<b>More than one race</b>							
2020-2021	13	223.31	20.23	221.69	25.33	-1.62	**
2021-2022	13	219.15	19.52	223.77	21.88	4.62	8.27

*Note: Only students who completed both assessments for both years were included in these analyses. \*\* Months of learning not calculated for negative growth*

## Conclusion

This evaluation yielded three key findings:

1. Year 2 mean score growth was greater than Year 1 growth in every grade level.
2. Mean score growth was substantially better overall and for most subgroups in Year 2, when compared to Year 1 score growth.
3. Tenth grade Hispanic students demonstrated more than two years of learning in Year 2 of *Reveal Math* implementation.

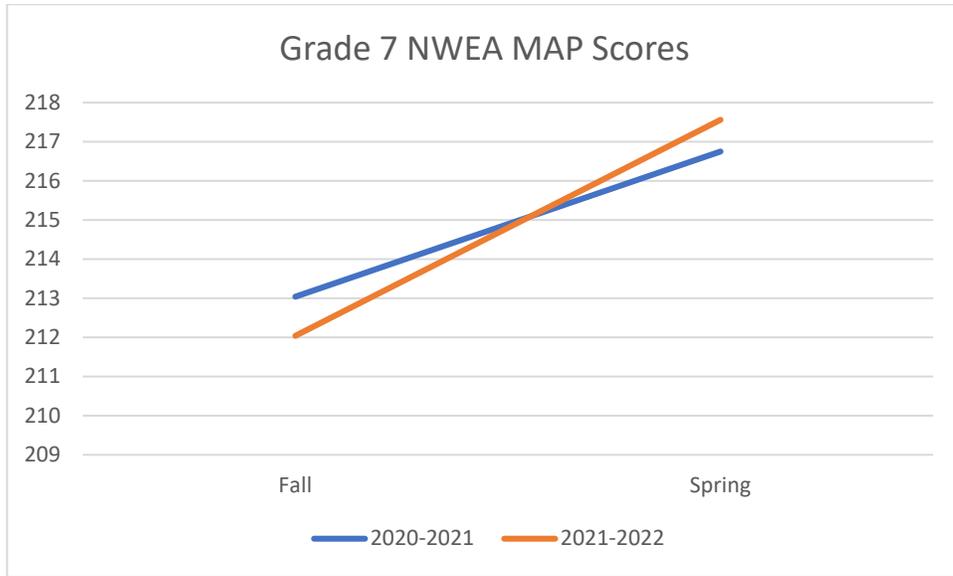
Each of the four analyses demonstrated that Year 2 growth was greater than Year 1 growth. The Year 1 to Year 2 disparities increased as students rose in grade levels. These findings should be taken with caution. The improved math assessment score growth in the second year of the curriculum's implementation could be a sign that teachers and students alike are becoming more comfortable with the curriculum and that it is being implemented with fidelity. It is also worth noting again that schooling was atypical because of the COVID-19 pandemic during the two years, and even more so in the first year the school district used *Reveal Math*. During the pandemic, teachers were asked to teach remotely (Marshall et al., 2022), and teachers were also asked to simultaneously teach students who were both physically present in the classroom and attending virtually (Bartlett, 2022) – both of which most were never trained to do. As such, it would be understandable if student learning was uneven during this period, especially where these learning modalities were most common. The gains in score growth could also be due in part to the poor score growth in Year 1 and/or the low fall scores students posted in Year 2. Learning loss due to COVID-19 (e.g., Halloran et al., 2021) has been a topic of substantial focus in the aftermath of the pandemic. Future work should continue to investigate the extent to which

educational interventions and curricula are able to improve student learning outcomes and make up for learning loss during the pandemic.

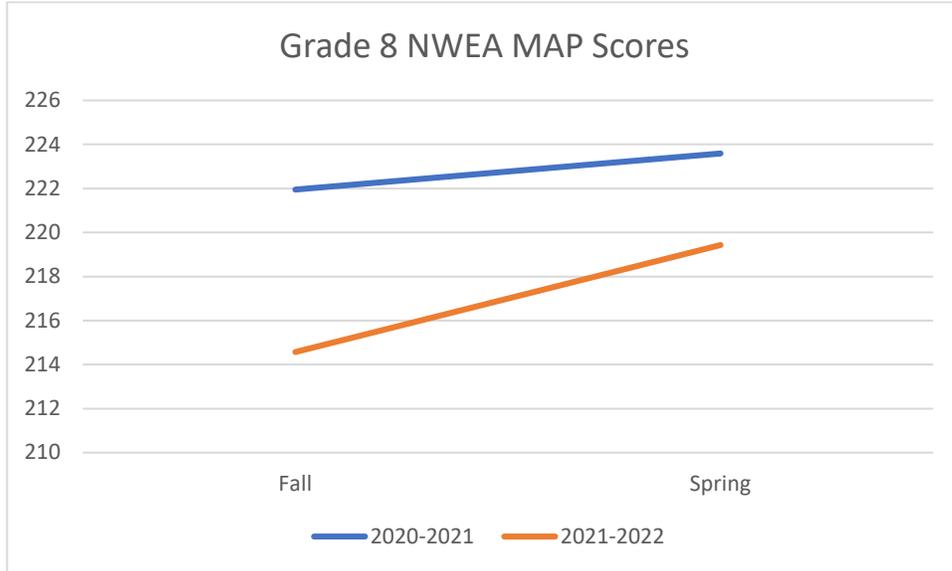
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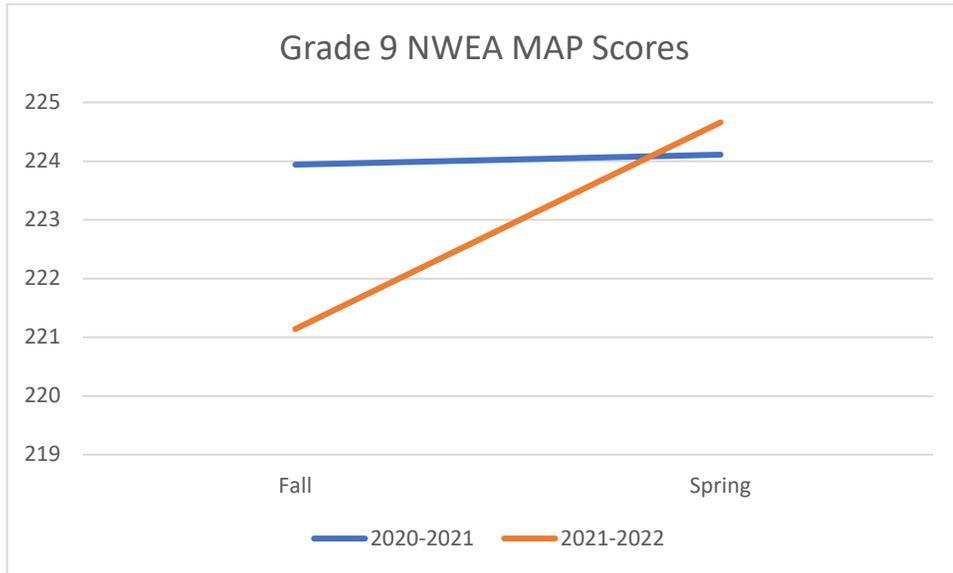
Appendix A



Appendix B



Appendix C.



Appendix D.

