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## Focus Group & Interview Coding Meeting

Study conducted by the Peabody Research Institute

at Vanderbilt University

PEABODY  
**research**  
institute

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# Table of Contents

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<b>Contents</b>	<b>Page</b>
Official Analysis Sample.....	3
Demographic Information .....	4
KeyMath Scores across Years .....	5
Woodcock-Johnson Scores across Years .....	8
Student Performance on Symbolic Number Comparison across Years .....	9
Student Performance on NonSymbolic Number Comparison across Years .....	9
Student Performance on Mapping Task Comparison across Years .....	10
Student Performance on Numeral Ordering Task.....	10
Student Performance on Corsi Blocks across Years .....	10
Student Performance on Inhibitory Control Task (Hearts & Flowers) across Years .....	11
8 <sup>th</sup> Grade Teacher Survey and Ratings of Students.....	12
Teacher Survey Information .....	13
Teacher Ratings of Students .....	15
Teacher Ratings by School Type .....	18
Correlations among 8 <sup>th</sup> Grade Student Outcomes and Teacher Ratings .....	19
Student Survey (TIMSS) across Years .....	20
Student Outcomes and Ratings by School Type across Years.....	24
Student Focus Group / Interview Card Sort Data .....	28

# Official Analysis Sample

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- There were 771 students in our database from the Pre-K study, and the goal for the newly consented sample, as written in the grant proposal, was 500 students.
  - 16 students withdrew from the study in 1<sup>st</sup> grade.
  - 29 students are no longer in the state.
  - 53 students are in the state but are not in Davidson County.
  - 45 students have not been located despite all efforts.
  - 34 students' parents declined to participate in the follow-up study (though 16 of those were communicated via the math teacher).
  - 72 students were located in Davidson County, but we could not get parental consent because of lack of response.
  - 3 additional students initially agreed to participate but parents never returned hard copy of consent form
- **THE OFFICIAL ANALYSIS SAMPLE CONSISTS OF 519 STUDENTS (517 assessed in Year 1, 513 assessed in Year 2, 503 assessed in Year 3, and 496 assessed in Year 4).**
  - *Note.* 4 students in Year 4 have partial data. 1 refused to complete any of the E-Prime Session measures, 1 refused portions of two E-Prime measures, 1 refused to complete the KeyMath Session (in addition to refusing to redo Hearts & Flowers), and 1 moved after completing the KeyMath Session and could not be located.

## Demographic Information (Assessed Sample for Year 4)

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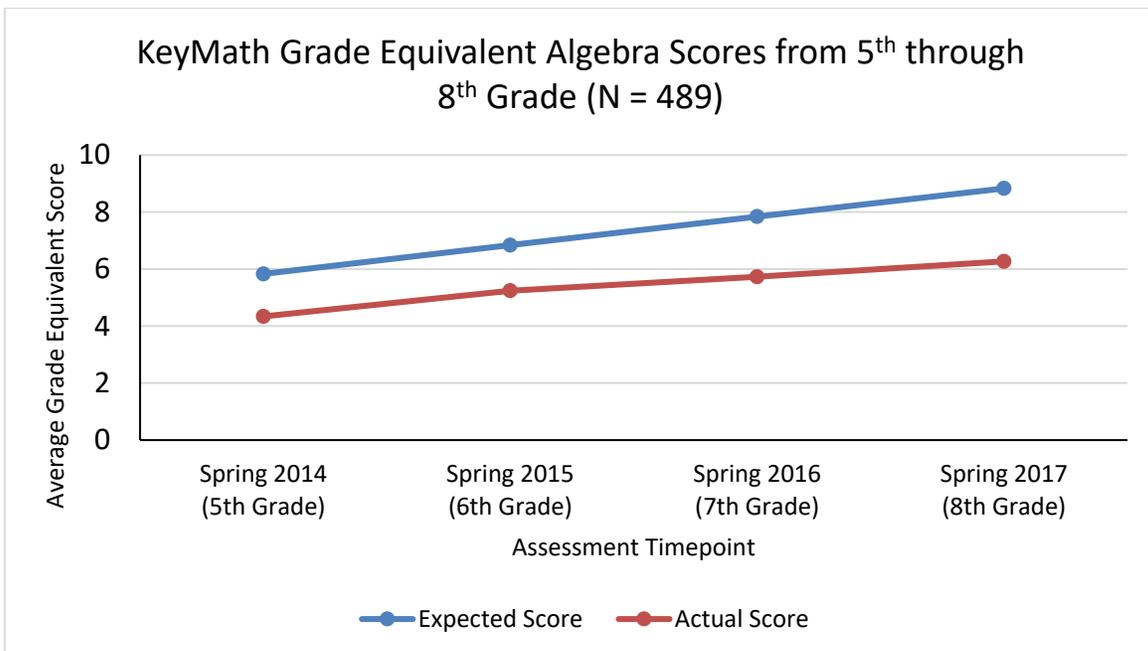
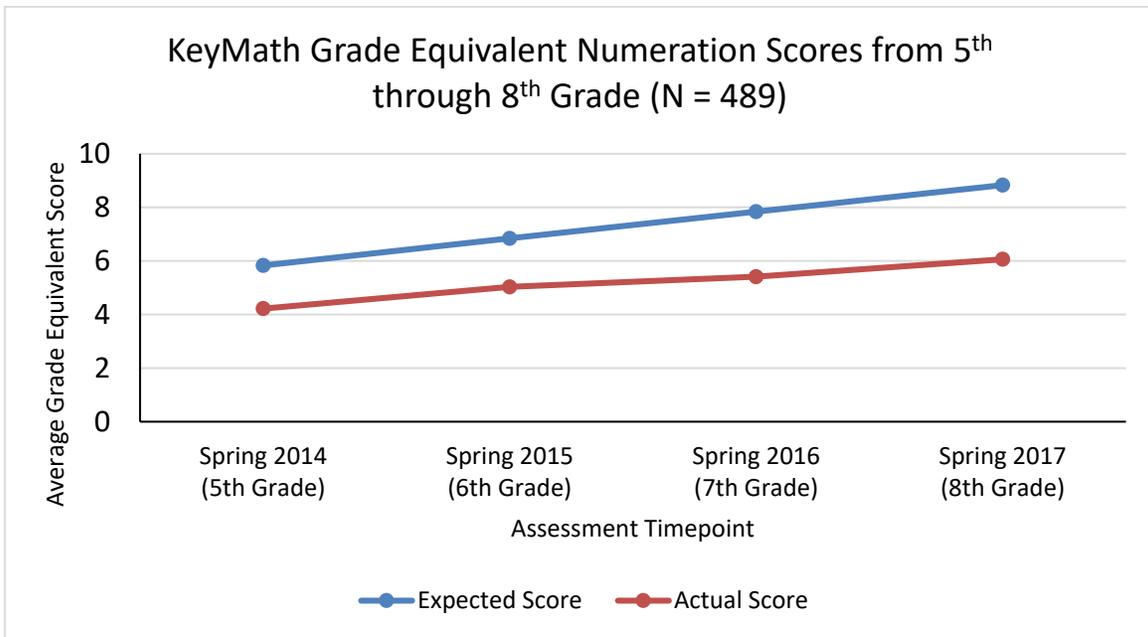
	<b>N</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>SD</b>
Age at Time of Testing (in years)	496	13.4	15.6	14.0	.326

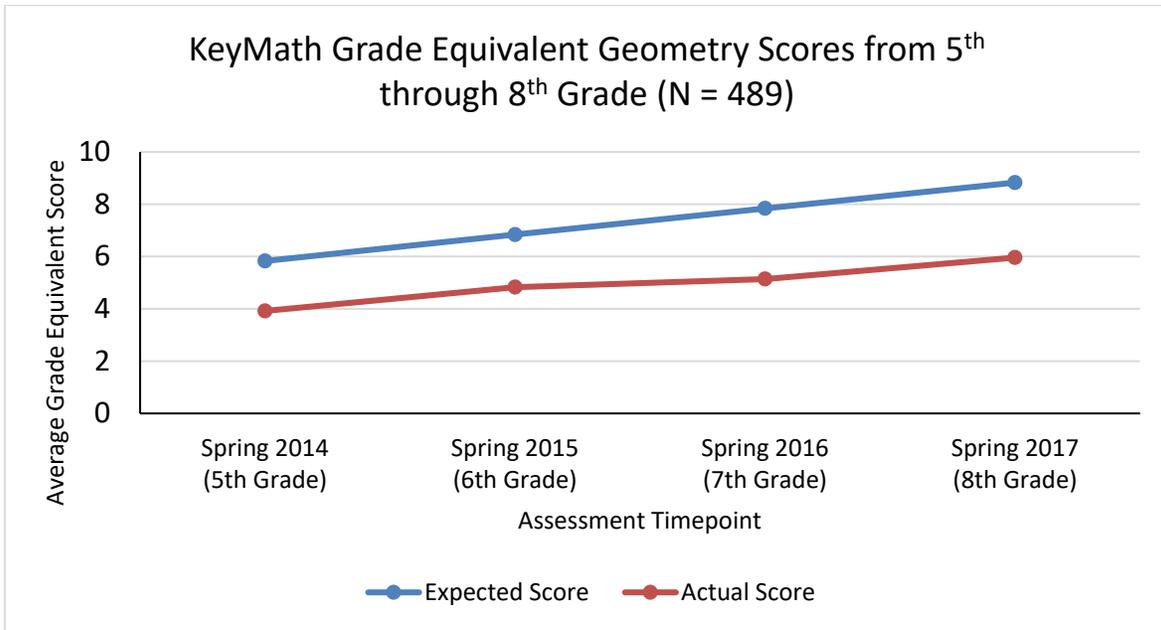
<b>Overall</b>		
	<b>Freq</b>	<b>Pct</b>
Ethnicity		
Black	392	79.0
White	43	8.7
Hispanic	41	8.3
Other	20	4.0
Gender		
Male	218	44.0
Female	278	56.0
Number of Current Schools*	75	-

*Note.* Most students were located in Davidson County, but we also assessed any student who had moved to a contiguous county (1 in Cheatham, 5 in Clarksville-Montgomery, 2 in Lebanon Special, 3 in Robertson, 10 in Rutherford, 9 in Sumner, and 3 in Wilson).

## KeyMath Scores across Years

- During the Follow-Up Study, there were 4 assessment time points: spring of 5<sup>th</sup> grade, 6<sup>th</sup> grade, 7<sup>th</sup> grade, and 8<sup>th</sup> grade.
- The graphs below show the grade equivalent KeyMath scores over time for those 489 students who were tested at all possible follow-up study time points.





### KeyMath Grade Equivalence Scores across Years

Year	Expected Grade	Test	N	M	SD	Mean - Expected Grade
Year 1	5.83	Number	517	4.20	1.98	-1.63
		Algebra	517	4.31	1.84	-1.52
		Geometry	517	3.90	1.97	-1.93
Year 2	6.84	Number	513	4.98	2.15	-1.86
		Algebra	513	5.20	2.25	-1.64
		Geometry	513	4.80	2.06	-2.04
Year 3	7.84	Number	503	5.38	2.55	-2.46
		Algebra	503	5.70	2.65	-2.14
		Geometry	503	5.13	2.31	-2.71
Year 4	8.83	Number	495	6.04	2.56	-2.79
		Algebra	495	6.23	2.64	-2.60
		Geometry	495	5.95	2.50	-2.88

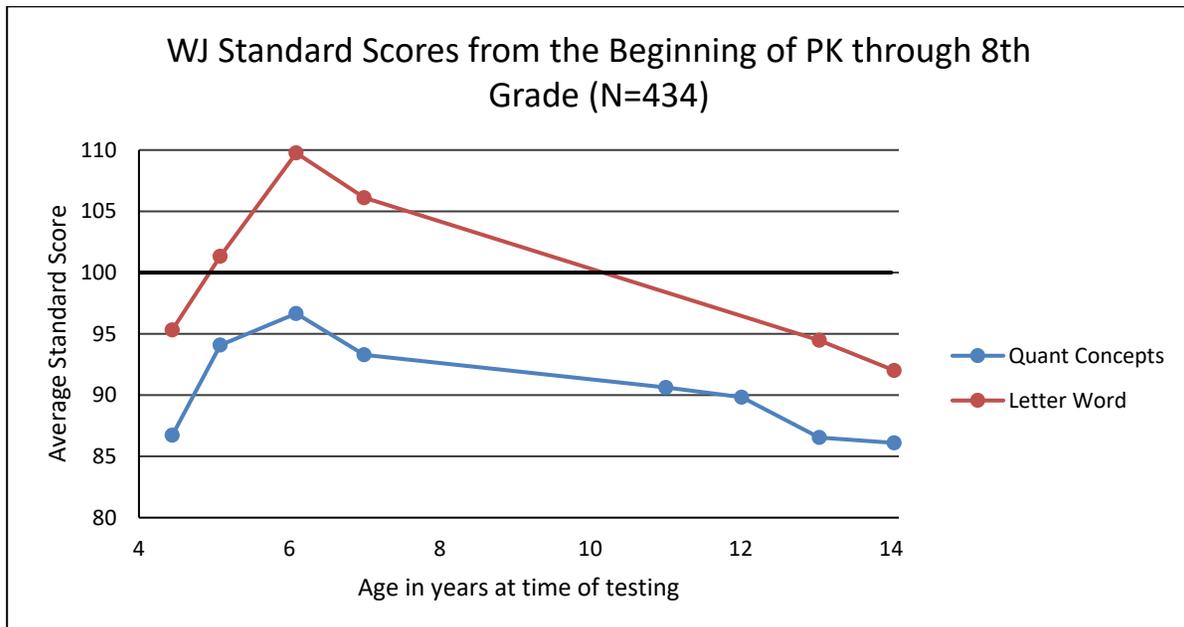
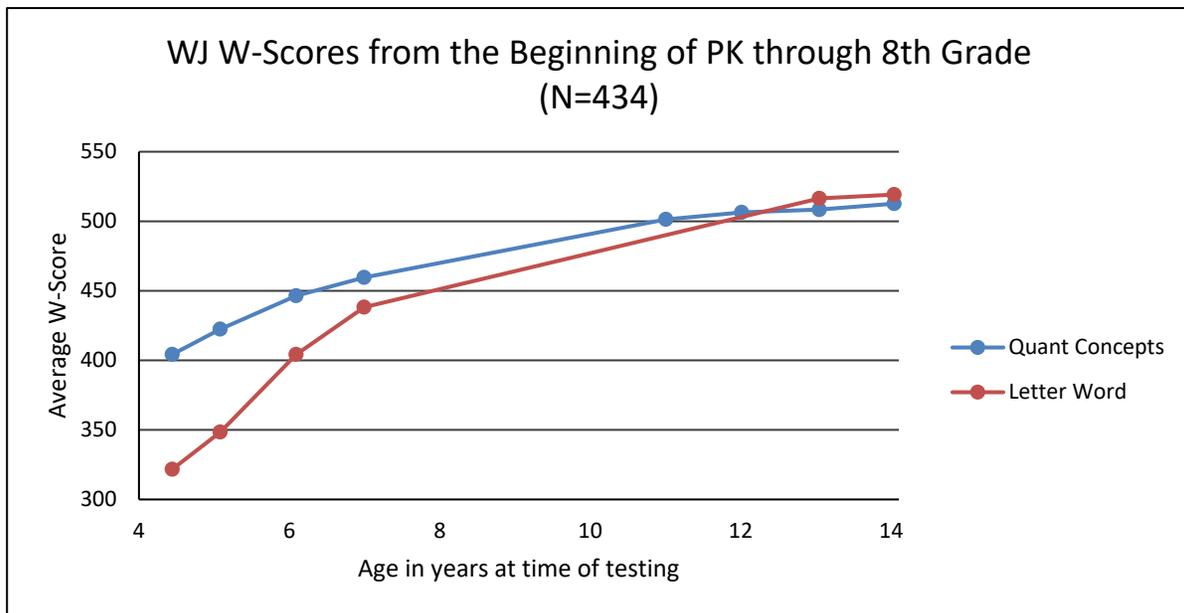
## KeyMath Age-Scaled Scores across Years

Note: Scale scores have a mean of 10 and SD of 3

Year	Mean Age	Test	N	M	SD
Year 1	11.01 years	Number	517	7.82	2.80
		Algebra	517	8.00	2.88
		Geometry	517	7.59	2.57
Year 2	12.01 years	Number	513	7.82	2.71
		Algebra	513	8.15	2.91
		Geometry	513	7.75	2.39
Year 3	13.05 years	Number	503	7.93	2.87
		Algebra	503	8.35	3.03
		Geometry	503	7.70	2.40
Year 4	14.04 years	Number	495	7.63	2.83
		Algebra	495	8.04	3.15
		Geometry	495	7.74	2.60

# Woodcock-Johnson Scores across Years

- From the original Building Blocks study through this year, there were 8 testing timepoints. They were: fall of PK, spring of PK, spring of K, spring of 1<sup>st</sup> grade, spring of 5<sup>th</sup> grade, spring of 6<sup>th</sup> grade, spring of 7<sup>th</sup> grade, and spring of 8<sup>th</sup> grade.
- Letter-Word Identification was only given in fall of PK, spring of PK, spring of K, spring of 1<sup>st</sup> grade, spring of 7<sup>th</sup> grade, and spring of 8<sup>th</sup> grade.
- The graphs below show the scores over time for those 434 students who were tested at all possible timepoints.



## Student Performance on Symbolic Number Comparison (NUM) across Years

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Year	Measure	N	Mean	SD
Year 1	NUM Percent Trials Correct	517	0.95	0.05
	NUM Mean RT for Correct Trials	517	740.72	198.69
	NUM Percent Trials Incorrect	517	0.05	0.05
	NUM Performance Score	517	814.10	232.16
Year 2	NUM Percent Trials Correct	513	0.91	0.07
	NUM Mean RT for Correct Trials	513	880.65	228.06
	NUM Percent Trials Incorrect	513	0.09	0.07
	NUM Performance Score	513	1037.89	259.45
Year 3	NUM Percent Trials Correct	503	0.92	0.06
	NUM Mean RT for Correct Trials	503	810.81	190.83
	NUM Percent Trials Incorrect	503	0.08	0.06
	NUM Performance Score	503	938.30	221.34
Year 4	NUM Percent Trials Correct	494	0.93	0.06
	NUM Mean RT for Correct Trials	494	761.97	165.23
	NUM Percent Trials Incorrect	494	0.07	0.06
	NUM Performance Score	494	865.38	194.47

*Note.* The symbolic number task changed from Year 1 to Year 2.

## Student Performance on NonSymbolic Number Comparison across Years

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Year	Measure	N	Mean	SD
Year 1	CD Percent Trials Correct	291	0.75	0.05
	CD Mean RT for Correct Trials	291	861.65	181.91
	CD Percent Trials Incorrect	291	0.25	0.05
	CD Performance Score	291	1294.31	265.81
Year 2	CD Percent Trials Correct	513	0.75	0.05
	CD Mean RT for Correct Trials	513	839.77	220.70
	CD Percent Trials Incorrect	513	0.25	0.05
	CD Performance Score	513	1257.32	328.62
Year 3	CD Percent Trials Correct	503	0.76	0.05
	CD Mean RT for Correct Trials	503	771.94	184.43
	CD Percent Trials Incorrect	503	0.24	0.05
	CD Performance Score	503	1141.58	266.77

*Note.* The Color Dots task was added after Year 1 data collection was already partially completed.

## Student Performance on Mapping Task Comparison (MAP) across Years

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Year	Measure	N	Mean	SD
Year 2	MAP Percent Trials Correct	507	0.70	0.08
	MAP Mean RT for Correct Trials	507	870.30	217.81
	MAP Percent Trials Incorrect	507	0.30	0.08
	MAP Performance Score	507	1390.98	329.13
Year 3	MAP Percent Trials Correct	502	0.69	0.08
	MAP Mean RT for Correct Trials	502	1230.14	263.22
	MAP Percent Trials Incorrect	502	0.31	0.08
	MAP Performance Score	502	1982.66	380.59
Year 4	MAP Percent Trials Correct	494	0.72	0.08
	MAP Mean RT for Correct Trials	494	1189.29	206.24
	MAP Percent Trials Incorrect	494	0.28	0.08
	MAP Performance Score	494	1854.85	322.43

*Note.* The Mapping Task changed from Year 2 to Year 3.

## Student Performance on Numeral Ordering (NUM ORD)

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	N	Min	Max	Mean	SD
ORD Overall Percent Trials Correct	465	0.14	1.00	0.79	0.14
ORD Overall Mean RT for Correct Trials	465	544.49	2296.39	1115.80	200.09
ORD Overall Percent Trials Incorrect	465	0.00	0.86	0.21	0.14
ORD Overall Performance Score	465	719.50	3946.81	1596.87	451.04
ORD Overall Percent Trials Correct: 1-digit	465	0.07	1.00	0.81	0.16
ORD Overall Percent Trials Correct: 2-digit	465	0.21	1.00	0.76	0.15
ORD Mean RT for Correct Trials: 1-digit	465	493.42	2302.93	1049.56	212.76
ORD Mean RT for Correct Trials: 2-digit	465	543.08	2382.18	1186.25	219.93

*Note.* Performance Score = Response Time\*(1 + 2\*Percent Trials Incorrect). 29 students do not have scores for this task: 28 students did not pass the practice section, and 1 refused to complete the second part of the task.

## Student Performance on Corsi Blocks across Years

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Year	Measure	N	Min	Max	Mean	SD
Year 1	Corsi Max Span	489	2	8	4.60	1.27
Year 2	Corsi Max Span	485	2	8	4.92	1.19
Year 3	Not Administered	-	-	-	-	-
Year 4	Corsi Max Span	483	2	8	5.30	1.18

*Note:* In year 4, 11 students are missing Corsi scores: 1 student failed to pass the practice section, and 10 students passed the practice section but did not get any trials correct.

# Student Performance on Inhibitory Control Task (Hearts & Flowers) across Years

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## Fixed Congruent Block

Year	Measure	N	Mean	SD
Year 1	HAF Percent Trials Correct	516	0.97	0.07
	HAF Mean RT per Trial	516	383.86	70.52
Year 2	HAF Percent Trials Correct	512	0.97	0.06
	HAF Mean RT per Trial	512	368.17	65.83
Year 3	HAF Percent Trials Correct	503	0.98	0.05
	HAF Mean RT per Trial	503	353.18	59.16
Year 4	HAF Percent Trials Correct	494	0.98	0.04
	HAF Mean RT per Trial	494	348.69	60.07

## Fixed Incongruent Block

Year	Measure	N	Mean	SD
Year 1	HAF Percent Trials Correct	485	0.88	0.18
	HAF Mean RT per Trial	481	454.24	92.85
Year 2	HAF Percent Trials Correct	511	0.90	0.16
	HAF Mean RT per Trial	508	428.24	91.02
Year 3	HAF Percent Trials Correct	502	0.93	0.13
	HAF Mean RT per Trial	502	396.45	64.66
Year 4	HAF Percent Trials Correct	492	0.95	0.13
	HAF Mean RT per Trial	491	386.91	71.14

*Note.* Some students did not pass the practice trials and did not have Incongruent Block data.

## Mixed Block

Year	Measure	N	Mean	SD
Year 1	HAF Percent Trials Correct	485	0.66	0.14
	HAF Mean RT per Trial	485	573.32	84.80
Year 2	HAF Percent Trials Correct	511	0.73	0.15
	HAF Mean RT per Trial	511	555.13	75.02
Year 3	HAF Percent Trials Correct	502	0.76	0.14
	HAF Mean RT per Trial	502	521.59	64.23
Year 4	HAF Percent Trials Correct	492	0.81	0.14
	HAF Mean RT per Trial	492	511.81	62.69

*Note.* Some students did not pass the practice trials and did not have Mixed Block data.

## 8<sup>th</sup> Grade Teacher Survey and Ratings of Students (TSSR)

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- The TSSR includes:
  - Section with teacher-specific questions (demographics, education, experience)
  - Section with student-specific questions (each consented student's math abilities, work habits, etc.) and classroom-specific questions (for math classes taught that include consented students, regarding textbook use, enrollment by ethnicity, etc.)
- We sent out 142 TSSRs to teachers with at least 1 consented student.
- **For Year 4, we have 121 fully completed and checked TSSRs (includes 471 students, 91% of consented student sample).**

# Teacher Survey Information

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## Information from the 121 completed teacher surveys

- Gender
  - 91 females (75%), 30 males (25%)
- Grades Taught
  - 35 teach 7<sup>th</sup> grade (29%), 71 teach 8<sup>th</sup> grade (59%), 15 teach multiple grades (12%)
- Preferred Grade To Teach
  - 9 teachers (7%) reported that they would prefer to teach younger students than their current grade(s) level
  - 91 teachers (75%) reported that their current grade(s) level is just right
  - 21 teachers (17%) reported that they would prefer to teach older students than their current grade(s) level
- Math Taught
  - 107 teachers (88%) currently only teach math, while 14 teachers (12%) also teach other subjects
- Experience
  - Years as a teacher
    - This is 1<sup>st</sup> year: 10 (8%)
    - 2-4 years: 32 (26%)
    - 5-10 years: 34 (28%)
    - More than 10 years: 45 (37%)
  - Years at current school
    - This is 1<sup>st</sup> year: 35 (29%)
    - 2-4 years: 53 (44%)
    - 5-10 years: 22 (18%)
    - More than 10 years: 11 (9%)
  - Years teaching middle grades math
    - This is 1<sup>st</sup> year: 18 (15%)
    - 2-4 years: 38 (31%)
    - 5-10 years: 36 (30%)
    - More than 10 years: 28 (23%)
    - Missing: 1 (1%)

*Note.* The 1 teacher coded as missing responded “0 years (does not teach middle school math)” even though he is a middle school math teacher.

- Licensure (categories add up to more than 100%)
  - Early Childhood license (at least): 4 (3%)
  - Elementary license (at least): 34 (28%)
  - Middle Grades license (at least): 68 (56%)
  - Secondary license (at least): 41 (34%)
  - Special Education license (at least): 16 (13%)
  - Transitional license (at least): 3 (3%)
- Education
  - Highest degree earned
    - Bachelor's degree: 50 (41%)
    - Master's degree: 48 (40%)
    - Master's degree + 30: 19 (16%)
    - Doctoral degree: 4 (3%)
  - Majored in math in undergraduate program
    - Yes: 30 (25%)
    - No: 91 (75%)
  - Minored in math in undergraduate program
    - Yes: 10 (8%)
    - No: 88 (73%)
    - No minor (NA): 23 (19%)
  - Majored in math in graduate school
    - Yes: 15 (12%)
    - No: 72 (60%)
    - No grad school (NA): 34 (28%)
- Name of math textbook used
  - Glencoe Math Built to the Common Core: 52 (43%)
  - None: 33 (27%)
  - Carnegie Learning: 7 (6%)
  - Houghton Mifflin Harcourt – Integrated Math I: 7 (6%)
  - College Preparatory Mathematics/Core Connections: 6 (5%)
  - i-Ready: 6 (5%)
  - Other: 8 (7%)
  - Missing or Not Specified: 2 (2%)
- How much you supplement the textbook with other materials
  - Almost never: 6 (5%)
  - A little: 19 (16%)
  - Somewhat: 30 (25%)
  - A lot: 43 (36%)
  - NA (no math textbook used): 23 (19%)
  - Note that 8 teachers who said they had no textbook said they supplemented the textbook a lot, and 2 teachers who said they had no textbook said they supplemented the textbook almost never.

# Teacher Ratings of Students

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## Information from the 471 completed teacher-rated students

- Does student receive individual tutoring in math?
  - Yes: 63 (13%)
  - No: 408 (87%)
- Does student receive pullout small group instruction in math?
  - Yes: 115 (24%)
  - No: 356 (76%)
- Does student participate in gifted/talented programs in math?
  - Yes: 10 (2%)
  - No: 461 (98%)
- Is ability grouping used within this student's grade?
  - Yes: 256 (54%)
  - No: 215 (46%)
- If there is ability grouping, how do the students in this student's class compare to typical students in this grade at this school?
  - Less skilled: 58 (12%)
  - About the same: 134 (29%)
  - More advanced: 64 (14%)
  - Not applicable (no ability grouping): 215 (46%)
- Does the teacher use ability grouping in this student's class?
  - Yes: 142 (30%)
  - No: 328 (70%)

*Note.* This item was accidentally left blank for 1 student. The teacher completed paper surveys after the school year ended and did not respond to follow-up.
- If there is ability grouping, how does this student compare to others in the class?
  - Less skilled: 45 (10%)
  - About the same: 56 (12%)
  - More advanced: 41 (9%)
  - Not applicable (no ability grouping): 328 (70%)

*Note.* 1 teacher did not complete the previous item for 1 student. This student is also missing in this question.
- How often does this student work to the best of his/her ability in math?
  - Always: 61 (13%)
  - Usually: 189 (40%)
  - Erratic: 131 (28%)
  - Seldom: 72 (15%)
  - Never: 18 (4%)

- How does this student's math skills compare to others in his/her grade?
  - Far above average: 24 (5%)
  - Above average: 106 (23%)
  - Average: 172 (37%)
  - Below average: 112 (24%)
  - Far below average: 24 (5%)
- How does this student's interest in math compare to others in his/her grade?
  - Far above average: 15 (3%)
  - Above average: 87 (19%)
  - Average: 217 (46%)
  - Below average: 109 (23%)
  - Far below average: 43 (9%)
- How prepared is this student for the next level in math?
  - Highly prepared: 55 (12%)
  - Mostly prepared: 113 (24%)
  - May struggle but is prepared: 142 (30%)
  - Somewhat unlikely to be prepared: 86 (18%)
  - Very unlikely to be prepared: 75 (16%)
- How long has the teacher taught this student math this year?
  - More than 6 months: 363 (77%)
  - 4-6 months: 69 (15%)
  - 1-3 months: 35 (7%)
  - Less than 1 month: 4 (1%)
- This student concentrates well and is not easily distracted when doing a task.
  - Strongly agree: 65 (14%)
  - Agree: 159 (34%)
  - Disagree: 166 (35%)
  - Strongly disagree: 81 (17%)
- This student easily plans and carries out activities that have several steps.
  - Strongly agree: 67 (14%)
  - Agree: 165 (35%)
  - Disagree: 164 (35%)
  - Strongly disagree: 75 (16%)
- This student finishes tasks and activities.
  - Strongly agree: 90 (19%)
  - Agree: 205 (44%)
  - Disagree: 120 (26%)
  - Strongly disagree: 56 (12%)

- This student actively uses resources for help and information.
  - Strongly agree: 73 (16%)
  - Agree: 193 (41%)
  - Disagree: 148 (31%)
  - Strongly disagree: 57 (12%)
- Does this student have math-specific difficulties?
  - Yes: 40 (9%)
  - No: 431 (92%)

▪ Responses (and frequency) if “Yes”:

Functionally delayed/Specific learning disability	15
ADHD/ADD	6
IEP	5
Computation and/or comprehension	4
IEP for math	3
Linguistic or reading disability	2
Receives accommodations for math	2
Emotional disturbance	2
Processing	2
Anxiety/Depression	1
Very low basic math skills	1
Unknown	1

*Note.* Some students had more than 1 disability.

### Teacher Ratings of Students by Year

	Year 1 (N=463)		Year 2 (N=503)		Year 3 (N=481)		Year 4 (N=471)	
	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
Works to best of ability in math <sup>1</sup>	3.68	0.97	3.46	0.99	3.46	1.00	3.43	1.02
Math skills compared to others <sup>1</sup>	2.93	1.05	2.74	1.02	2.83	1.03	2.85	1.06
Interest in math compared to others <sup>1</sup>	2.97	0.87	2.92	0.89	2.90	0.92	2.83	0.94
Prepared for next level in math <sup>1</sup>	3.26	1.18	2.94	1.21	2.89	1.20	2.97	1.24
Concentrates well/not easily distracted <sup>2</sup>	2.63	0.94	2.61	0.99	2.40	0.94	2.44	0.93
Easily plans and carries out activities that have several steps <sup>2</sup>	2.68	0.87	2.48	0.99	2.48	0.91	2.48	0.92
Finishes tasks and activities <sup>2</sup>	2.90	0.81	2.84	0.90	2.66	0.89	2.70	0.91
Actively uses resources for help and information <sup>2</sup>	2.69	0.87	2.65	0.93	2.60	0.86	2.60	0.89

<sup>1</sup> These ratings were on a scale from 1 to 5, so 3 would be an average rating.

<sup>2</sup> These ratings were on a scale from 1 to 4 (1 = “Strongly Disagree”, 2 = “Disagree”, 3 = “Agree”, and 4 = “Strongly Agree”).

## 8<sup>th</sup> Grade Teacher Ratings of Students by School Type

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### Ratings of Student Skills

	Range	CHARTER (N=96)	IZONE (N=41)	MIDDLE (N=313)	OTHER (N=21)
Works to best of ability in math	1 to 5	3.60 (0.96)	2.98 (1.11)	3.44 (1.03)	3.43 (0.68)
Math skills compared to others	1 to 5	3.02 (1.07)	2.63 (1.14)	2.82 (1.06)	2.81 (0.93)
Interest in math compared to others	1 to 5	2.94 (0.96)	2.66 (1.04)	2.82 (0.93)	2.86 (0.73)
Prepared for next level in math	1 to 5	3.09 (1.28)	2.61 (1.30)	2.98 (1.22)	3.00 (1.10)
Concentrates well/not easily distracted	1 to 4	2.61 (0.88)	2.12 (0.84)	2.42 (0.96)	2.62 (0.81)
Easily plans and carries out activities that have several steps	1 to 4	2.72 (0.89)	2.22 (0.85)	2.44 (0.94)	2.33 (0.80)
Finishes tasks and activities	1 to 4	2.86 (0.83)	2.49 (0.87)	2.67 (0.94)	2.81 (0.81)
Actively uses resources for help and information	1 to 4	2.74 (0.80)	2.24 (0.94)	2.61 (0.91)	2.43 (0.75)

*Note.* Green cells indicate the highest overall rating for that item.

## Correlations among 8<sup>th</sup> Grade Student Outcomes and Teacher Ratings

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### Zero-Order Correlations

Direct Assessment	TSSR: Math skills compared to others	TSSR: Interest in math compared to others	TSSR: Prepared for next level in math	TSSR: Self-Reg Items (Mean)
KM Number (Age-Scaled)	.61	.43	.55	.42
KM Algebra (Age-Scaled)	.61	.46	.59	.46
KM Geometry (Age-Scaled)	.49	.39	.44	.36
WJ Quant. Cpts. (Std Score)	.62	.47	.57	.47
WJ Letter Word (Std Score)	.42	.32	.39	.31
TIMSS Confidence Subscale	.44	.43	.49	.39
TIMSS Value of Math Subscale	.03	.09	.08	.05
TIMSS Like Math Subscale	.24	.29	.31	.27
TIMSS Total Score	.36	.38	.42	.34
Number: Accuracy	.25	.16	.25	.19
Number: Correct RT	-.14	-.12	-.17	-.14
Mapping: Accuracy	.37	.30	.40	.32
Mapping: Correct RT	.00	-.03	-.02	-.01
Numeral Ordering: Accuracy	.30	.22	.31	.25
Numeral Ordering: Correct RT	-.10	-.07	-.13	-.06
HAF: Accuracy (Congruent)	.18	.15	.16	.17
HAF: RT (Congruent)	-.14	-.11	-.18	-.14
HAF: Accuracy (Incongruent)	.27	.13	.28	.20
HAF: RT (Incongruent)	-.26	-.16	-.24	-.17
HAF: Accuracy (Mixed)	.30	.22	.31	.24
HAF: RT (Mixed)	-.14	-.06	-.12	-.07
Corsi: Highest Span	.27	.14	.23	.19

*Note.* Red cells indicate correlations greater than .20. Green cells indicate correlations less than -.20.

## 6<sup>th</sup> Grade Student Survey Descriptives: TIMSS (*Trends in International Mathematics and Science Study*)

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	N	Min	Max	Mean	SD
<b>Confidence Scale Average</b>	<b>513</b>	<b>1.42</b>	<b>4.00</b>	<b>3.22</b>	<b>0.58</b>
I know what my math teacher expects	513	1	4	3.78	0.51
My math teacher is easy to understand	513	1	4	3.28	0.84
I usually do well in math	513	1	4	3.36	0.79
Math is more difficult for me than my classmates (reverse coded)	513	1	4	2.85	1.04
Math is not one of my strengths (reverse coded)	513	1	4	3.11	1.09
I learn quickly in math	513	1	4	3.03	0.92
Math makes me confused and nervous (reverse coded)	513	1	4	2.99	1.01
I am good at working out hard math problems	513	1	4	2.91	0.94
My teacher thinks I am good at working out hard math problems	512	1	4	3.33	0.80
My teacher tells me I am good at math	513	1	4	3.35	0.86
Math is harder for me than other subjects (reverse coded)	513	1	4	3.04	1.08
My family thinks I am good at math	512	1	4	3.57	0.72
<b>Value Scale Average</b>	<b>513</b>	<b>1.17</b>	<b>4.00</b>	<b>3.55</b>	<b>0.40</b>
It is important to do well in math	513	1	4	3.86	0.49
Learning math will help me in daily life	513	1	4	3.81	0.51
I need math to learn other subjects	513	1	4	3.30	0.85
I need to do well in math to get into college	513	1	4	3.79	0.55
I need to do well in math to get the job I want	513	1	4	3.74	0.60
I would like a job that uses math	513	1	4	2.83	1.00
<b>Like Learning Scale Average</b>	<b>513</b>	<b>1.38</b>	<b>4.00</b>	<b>3.37</b>	<b>0.53</b>
I enjoy learning math	513	1	4	3.51	0.65
I wish I did not have to study math (reverse coded)	513	1	4	3.31	0.87
Math is boring (reverse coded)	513	1	4	3.27	0.92
I learn interesting things in math	513	1	4	3.71	0.62
I like math	513	1	4	3.52	0.75
I think of things not related to the lesson (reverse coded)	513	1	4	2.77	0.97
I'm interested in what my math teacher says	513	1	4	3.46	0.73
My math teacher gives me interesting things to do	513	1	4	3.45	0.78

*Note.* All negative items above were reverse coded (e.g., Math is boring) so that on all items higher scores mean more positive student ratings.

## 7<sup>th</sup> Grade Student Survey Outcomes: TIMSS (*Trends in International Mathematics and Science Study*)

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	<b>N</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>SD</b>
<b>Confidence Scale Average</b>	<b>503</b>	<b>1.33</b>	<b>4.00</b>	<b>3.07</b>	<b>0.62</b>
I know what my math teacher expects	503	1	4	3.76	0.51
My math teacher is easy to understand	503	1	4	3.13	0.86
I usually do well in math	503	1	4	3.22	0.83
Math is more difficult for me than my classmates (reverse coded)	503	1	4	2.72	1.06
Math is not one of my strengths (reverse coded)	503	1	4	2.85	1.15
I learn quickly in math	503	1	4	2.87	0.98
Math makes me confused and nervous (reverse coded)	503	1	4	2.86	1.03
I am good at working out hard math problems	503	1	4	2.74	0.96
My teacher thinks I am good at working out hard math problems	503	1	4	3.19	0.84
My teacher tells me I am good at math	503	1	4	3.29	0.88
Math is harder for me than other subjects (reverse coded)	503	1	4	2.82	1.14
My family thinks I am good at math	503	1	4	3.41	0.80
<b>Value Scale Average</b>	<b>503</b>	<b>1.33</b>	<b>4.00</b>	<b>3.52</b>	<b>0.42</b>
It is important to do well in math	503	1	4	3.89	0.39
Learning math will help me in daily life	503	1	4	3.76	0.53
I need math to learn other subjects	503	1	4	3.36	0.80
I need to do well in math to get into college	503	1	4	3.76	0.55
I need to do well in math to get the job I want	503	1	4	3.69	0.67
I would like a job that uses math	503	1	4	2.66	0.99
<b>Like Learning Scale Average</b>	<b>503</b>	<b>1.13</b>	<b>4.00</b>	<b>3.21</b>	<b>0.60</b>
I enjoy learning math	503	1	4	3.32	0.74
I wish I did not have to study math (reverse coded)	503	1	4	3.23	0.90
Math is boring (reverse coded)	503	1	4	3.03	0.96
I learn interesting things in math	503	1	4	3.62	0.70
I like math	503	1	4	3.25	0.93
I think of things not related to the lesson (reverse coded)	503	1	4	2.59	0.92
I'm interested in what my math teacher says	503	1	4	3.30	0.77
My math teacher gives me interesting things to do	503	1	4	3.34	0.81

*Note.* All negative items above were reverse coded (e.g., Math is boring) so that on all items higher scores mean more positive student ratings.

## 8<sup>th</sup> Grade Student Survey Outcomes: TIMSS (*Trends in International Mathematics and Science Study*)

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	N	Min	Max	Mean	SD
<b>Confidence Scale Average</b>	<b>496</b>	<b>1.25</b>	<b>4.00</b>	<b>3.01</b>	<b>0.65</b>
I know what my math teacher expects	496	1	4	3.66	0.58
My math teacher is easy to understand	496	1	4	2.98	0.91
I usually do well in math	496	1	4	3.23	0.84
Math is more difficult for me than my classmates (reverse coded)	496	1	4	2.72	1.00
Math is not one of my strengths (reverse coded)	496	1	4	2.73	1.16
I learn quickly in math	496	1	4	2.83	0.94
Math makes me confused and nervous (reverse coded)	496	1	4	2.83	0.98
I am good at working out hard math problems	496	1	4	2.77	0.94
My teacher thinks I am good at working out hard math problems	496	1	4	3.17	0.84
My teacher tells me I am good at math	496	1	4	3.16	0.86
Math is harder for me than other subjects (reverse coded)	496	1	4	2.78	1.16
My family thinks I am good at math	496	1	4	3.30	0.84
<b>Value Scale Average</b>	<b>496</b>	<b>2.00</b>	<b>4.00</b>	<b>3.47</b>	<b>0.43</b>
It is important to do well in math	496	1	4	3.87	0.42
Learning math will help me in daily life	496	1	4	3.72	0.57
I need math to learn other subjects	496	1	4	3.37	0.77
I need to do well in math to get into college	496	1	4	3.74	0.54
I need to do well in math to get the job I want	496	1	4	3.60	0.70
I would like a job that uses math	496	1	4	2.54	1.04
<b>Like Learning Scale Average</b>	<b>496</b>	<b>1.00</b>	<b>4.00</b>	<b>3.06</b>	<b>0.60</b>
I enjoy learning math	496	1	4	3.24	0.80
I wish I did not have to study math (reverse coded)	496	1	4	3.07	0.91
Math is boring (reverse coded)	496	1	4	2.84	0.97
I learn interesting things in math	496	1	4	3.49	0.73
I like math	496	1	4	3.15	0.99
I think of things not related to the lesson (reverse coded)	496	1	4	2.43	0.90
I'm interested in what my math teacher says	496	1	4	3.13	0.82
My math teacher gives me interesting things to do	496	1	4	3.09	0.91

*Note.* All negative items above were reverse coded (e.g., Math is boring) so that on all items higher scores mean more positive student ratings.

### **Student Ratings for Subscales by Year**

	Year 2		Year 3		Year 4	
	MEAN	SD	MEAN	SD	MEAN	SD
Students' Confidence in Mathematics Avg	3.22	.58	3.07	0.62	3.01	0.65
Students Value Mathematics Avg	3.55	.40	3.52	0.42	3.47	0.43
Students Like Learning Mathematics Avg	3.37	.53	3.21	0.60	3.06	0.62

## 5<sup>th</sup> Grade Student Outcomes by School Type

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Direct Assessment Outcomes by School Type										
	<i>CHARTER</i>		<i>ELEMENTARY</i>		<i>IZONE</i>		<i>MIDDLE</i>		<i>OTHER</i>	
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
KM Number (age scaled)	108	8.44	72	6.35	81	7.60	255	8.05	1	5.00
KM Algebra (age scaled)	108	8.64	72	6.40	81	7.89	255	8.24	1	4.00
KM Geometry (age scaled)	108	7.65	72	6.42	81	7.84	255	7.82	1	7.00
WJ Quant. Cpts. (standard score)	108	91.68	72	80.71	81	87.31	255	93.98	1	73.00
WJ Quant. Cpts. (W score)	108	502.55	72	490.61	81	497.69	255	505.07	1	482.00
Functions: Total	108	7.33	72	4.61	81	6.20	255	7.54	1	0.00
Number: Accuracy	108	0.96	72	0.93	81	0.94	255	0.96	1	0.86
Number: Correct RT	108	739.74	72	754.74	81	734.45	255	738.42	1	929.47
Dots: Accuracy	108	0.59	72	0.58	81	0.61	255	0.61	1	0.67
Dots: Correct RT	105	820.03	69	801.92	80	809.43	250	835.00	1	866.10
Color Dots: Accuracy	56	0.75	55	0.75	35	0.75	144	0.75	1	0.86
Color Dots: Correct RT	56	867.48	55	854.31	35	888.42	144	855.13	1	940.42
HAF: Accuracy (congruent)	108	0.97	71	0.97	81	0.97	255	0.96	1	1.00
HAF: RT (congruent)	108	390.51	71	392.21	81	380.67	255	379.70	1	390.50
HAF: Accuracy (incongruent)	103	0.88	66	0.85	76	0.89	239	0.88	1	0.92
HAF: RT (incongruent)	102	457.01	65	468.03	75	463.40	238	445.83	1	587.64
HAF: Accuracy (mixed)	103	0.66	66	0.62	76	0.68	239	0.68	1	0.44
HAF: RT (mixed)	103	578.58	66	567.73	76	573.21	239	573.31	1	411.62
Corsi: Highest span	106	4.50	71	3.70	81	4.23	249	4.69	0	---

## 6<sup>th</sup> Grade Student Outcomes and TIMSS Ratings by School Type

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Direct Assessment Outcomes by School Type								
	<i>CHARTER</i>		<i>IZONE</i>		<i>MIDDLE</i>		<i>OTHER</i>	
	N	Mean	N	Mean	N	Mean	N	Mean
KM Number (age scaled)	123	8.11	75	7.23	310	7.85	5	7.40
KM Algebra (age scaled)	123	8.54	75	7.84	310	8.06	5	8.60
KM Geometry (age scaled)	123	7.88	75	7.41	310	7.78	5	8.20
WJ Quant. Cpts. (standard score)	123	90.07	75	84.89	310	90.53	5	86.80
WJ Quant. Cpts. (W score)	123	506.77	75	500.93	310	507.15	5	503.20
Functions: Total	123	8.35	75	7.52	310	8.08	5	8.80
Number: Accuracy	123	0.92	75	0.90	310	0.90	5	0.91
Number: Correct RT	123	908.80	75	879.75	310	868.50	5	954.27
Color Dots: Accuracy	123	0.75	75	0.74	310	0.75	5	0.74
Color Dots: Correct RT	123	870.95	75	848.30	310	825.19	5	848.74
Mapping: Accuracy	123	0.70	75	0.68	310	0.69	5	0.65
Mapping: Correct RT	121	898.79	74	870.82	307	859.21	5	854.13
HAF: Accuracy (congruent)	123	0.98	75	0.97	309	0.97	5	0.95
HAF: RT (congruent)	123	363.11	75	380.29	309	366.06	5	441.57
HAF: Accuracy (incongruent)	123	0.91	75	0.90	308	0.91	5	0.75
HAF: RT (incongruent)	122	429.47	75	445.85	306	422.20	5	503.60
HAF: Accuracy (mixed)	123	0.74	75	0.71	308	0.74	5	0.74
HAF: RT (mixed)	123	558.00	75	565.09	308	551.17	5	579.57
Corsi: Highest span	123	4.75	75	4.58	310	4.73	5	3.80

Student Ratings by School Type								
	<i>CHARTER</i>		<i>IZONE</i>		<i>MIDDLE</i>		<i>OTHER</i>	
	N	Mean	N	Mean	N	Mean	N	Mean
TIMSS: Confidence	123	3.22	74	3.27	310	3.20	5	3.45
TIMSS: Value	123	3.55	75	3.60	310	3.54	5	3.73
TIMSS: Liking	123	3.44	75	3.38	310	3.34	5	3.70
TIMSS: Total	123	87.46	75	87.64	310	86.39	5	93.40

## 7<sup>th</sup> Grade Student Outcomes and TIMSS Ratings by School Type

Direct Assessment Outcomes by School Type								
	<i>CHARTER</i>		<i>IZONE</i>		<i>MIDDLE</i>		<i>OTHER</i>	
	N	Mean	N	Mean	N	Mean	N	Mean
KM Number (age scaled)	113	8.44	64	7.09	323	7.89	3	10.00
KM Algebra (age scaled)	113	8.98	64	7.58	323	8.27	3	10.33
KM Geometry (age scaled)	113	8.00	64	7.17	323	7.68	3	9.67
WJ Quant. Concepts (standard score)	113	88.35	64	83.66	323	86.11	3	88.00
WJ Letter Word (standard score)	113	94.98	64	89.66	323	94.71	3	101.33
Number: Accuracy	113	0.92	64	0.91	323	0.92	3	0.92
Number: Correct RT	113	817.58	64	855.25	323	799.90	3	782.73
Color Dots: Accuracy	113	0.76	64	0.76	323	0.76	3	0.75
Color Dots: Correct RT	113	780.34	64	806.94	323	762.91	3	681.29
Mapping: Accuracy	112	0.70	64	0.68	323	0.69	3	0.74
Mapping: Correct RT	112	1231.57	64	1231.58	323	1229.47	3	1217.00
HAF: Accuracy (congruent)	113	0.98	64	0.97	323	0.98	3	0.92
HAF: RT (congruent)	113	351.87	64	342.08	323	356.08	3	327.25
HAF: Accuracy (incongruent)	113	0.94	64	0.91	322	0.93	3	1.00
HAF: RT (incongruent)	113	401.16	64	396.19	322	395.14	3	364.89
HAF: Accuracy (mixed)	113	0.77	64	0.73	322	0.77	3	0.78
HAF: RT (mixed)	113	523.01	64	513.98	322	522.63	3	519.14

Student Ratings by School Type								
	<i>CHARTER</i>		<i>IZONE</i>		<i>MIDDLE</i>		<i>OTHER</i>	
	N	Mean	N	Mean	N	Mean	N	Mean
TIMSS: Confidence	113	3.08	64	3.17	323	3.05	3	3.22
TIMSS: Value	113	3.53	64	3.58	323	3.51	3	3.78
TIMSS: Liking	113	3.21	64	3.32	323	3.18	3	3.79
TIMSS: Total	113	83.87	64	85.98	323	83.07	3	91.67

Student Ratings if Attended an Alternative School						
	<i>Attended Alternative School</i>			<i>Didn't Attend Alternative School</i>		
	N	Mean	SD	N	Mean	SD
TIMSS: Confidence	16	3.20	0.50	487	3.07	0.62
TIMSS: Value	16	3.43	0.50	487	3.52	0.41
TIMSS: Liking	16	3.11	0.44	487	3.21	0.60
TIMSS: Total	16	83.81	10.32	487	83.67	12.68

## 8<sup>th</sup> Grade Student Outcomes and TIMSS Ratings by School Type

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Direct Assessment Outcomes by School Type								
	<i>CHARTER</i>		<i>IZONE</i>		<i>MIDDLE</i>		<i>OTHER</i>	
	N	Mean	N	Mean	N	Mean	N	Mean
KM Number (age scaled)	97	8.38	46	7.11	331	7.44	21	8.29
KM Algebra (age scaled)	97	9.00	46	7.70	331	7.78	21	8.52
KM Geometry (age scaled)	97	8.55	46	7.50	331	7.51	21	8.14
WJ Quant. Concepts (standard score)	97	88.77	46	83.17	330	85.56	21	86.67
WJ Letter Word (standard score)	97	92.90	46	89.80	330	92.23	21	89.95
Number: Accuracy	97	0.93	46	0.92	330	0.93	21	0.93
Number: Correct RT	97	771.15	46	776.90	330	755.51	21	788.23
Mapping: Accuracy	97	0.72	46	0.72	330	0.72	21	0.71
Mapping: Correct RT	97	1182.33	46	1193.51	330	1189.23	21	1213.07
Numeral Ordering: Accuracy	95	0.79	37	0.78	313	0.78	20	0.83
Numeral Ordering: Correct RT	95	1157.49	37	1141.96	313	1099.42	20	1125.81
HAF: Accuracy (congruent)	97	0.98	46	0.99	330	0.99	21	0.96
HAF: RT (congruent)	97	351.15	46	361.52	330	346.01	21	351.33
HAF: Accuracy (incongruent)	97	0.96	46	0.91	328	0.95	21	0.90
HAF: RT (incongruent)	97	385.60	46	395.21	327	383.93	21	421.01
HAF: Accuracy (mixed)	97	0.82	46	0.79	328	0.82	21	0.76
HAF: RT (mixed)	97	517.76	46	495.51	328	511.50	21	524.73
Corsi: Highest Span	96	5.26	42	5.14	325	5.35	20	5.00

Student Ratings by School Type								
	<i>CHARTER</i>		<i>IZONE</i>		<i>MIDDLE</i>		<i>OTHER</i>	
	N	Mean	N	Mean	N	Mean	N	Mean
TIMSS: Confidence	97	3.07	46	3.04	332	2.99	21	3.04
TIMSS: Value	97	3.50	46	3.59	332	3.45	21	3.51
TIMSS: Liking	97	3.04	46	3.08	332	3.06	21	2.99
TIMSS: Total	97	82.14	46	82.65	332	81.08	21	81.43

Student Ratings if Attended an Alternative School						
	<i>Attended Alternative School</i>			<i>Didn't Attend Alternative School</i>		
	N	Mean	SD	N	Mean	SD
TIMSS: Confidence	17	2.96	0.63	479	3.02	0.65
TIMSS: Value	17	3.62	0.33	479	3.47	0.43
TIMSS: Liking	17	2.99	0.53	479	3.06	0.62
TIMSS: Total	17	81.06	12.38	479	81.46	13.40

# Student Focus Group/Interview Card Sort Data

## Topic 1: Math in the Middle Grades

- 502 students were asked which activities happen most in their math class.
- Of the activities that happen most, students were asked to select those they like. The percentages reported are out of the number of students who said that activity happens (i.e., out of the number of students who could have possibly chosen it as something they like because they said it does happen in their classrooms).

	Happens		Like	
	N	Percent	N	Percent
<b>Worksheets</b>	492	98	151	31
<b>Small Group (w/o teacher)</b>	472	94	358	76
<b>Teacher Lecture</b>	471	94	139	30
<b>Show Work on Board</b>	438	87	257	59
<b>Comparing Solutions</b>	406	81	167	41
<b>Small Group Teacher</b>	394	78	232	59
<b>Computers</b>	327	65	265	81
<b>Books</b>	306	61	94	31
<b>Small Group Projects</b>	280	56	204	73
<b>Movie</b>	274	55	207	76
<b>Games</b>	227	45	176	78
<b>SG Outside Class</b>	119	24	87	73

## Topic 2: Math in the Real World

- Students were asked which professions use math and which do not use math.
- Students were asked which professions they most want to do out of those that use math and out of those that do not use math.

	Uses Math		Uses Math & Like		Doesn't Use Math & Like	
	N	Percent	N	Percent	N	Percent
<b>Cashier</b>	482	96	155	32	7	35
<b>Teacher</b>	473	94	139	29	11	38
<b>Sales floor associate</b>	411	82	119	29	31	34
<b>Scientist</b>	403	80	185	46	40	40
<b>Chef</b>	381	76	232	61	58	48
<b>Computer Programmer</b>	377	75	139	37	28	22
<b>Nurse</b>	340	68	145	43	72	44
<b>Shipper</b>	310	62	48	15	33	17
<b>Uber Driver</b>	296	59	79	27	85	41
<b>Athlete</b>	275	55	184	67	138	61
<b>Receptionist</b>	262	52	45	17	52	22
<b>Soldier</b>	221	44	84	38	100	36
<b>Politician</b>	201	40	36	18	49	16
<b>Truck Driver</b>	181	36	27	15	35	11

### Topic 3: Early Learning/Elementary School Math

- Students were asked which activities teachers used in their K, 1<sup>st</sup>, and 2<sup>nd</sup> grade math classes.
- Of the activities that their teachers used, students were asked to select those they liked. The percentages reported are out of the number of students who said that activity was used (i.e., out of the number of students who could have possibly chosen it as something they liked because they said it did happen in their classrooms).

	<b>Happened</b>		<b>Liked</b>	
	<b>N</b>	<b>Percent</b>	<b>N</b>	<b>Percent</b>
<b>Math Game</b>	459	91	384	84
<b>Counting</b>	454	90	329	72
<b>Whole Group Math</b>	450	90	298	66
<b>Worksheet</b>	441	88	158	36
<b>Sharing w/ Teacher</b>	428	85	234	55
<b>Teacher Lecture</b>	424	84	110	26
<b>Sharing w/ Class</b>	357	71	178	50
<b>Tower</b>	281	56	240	85