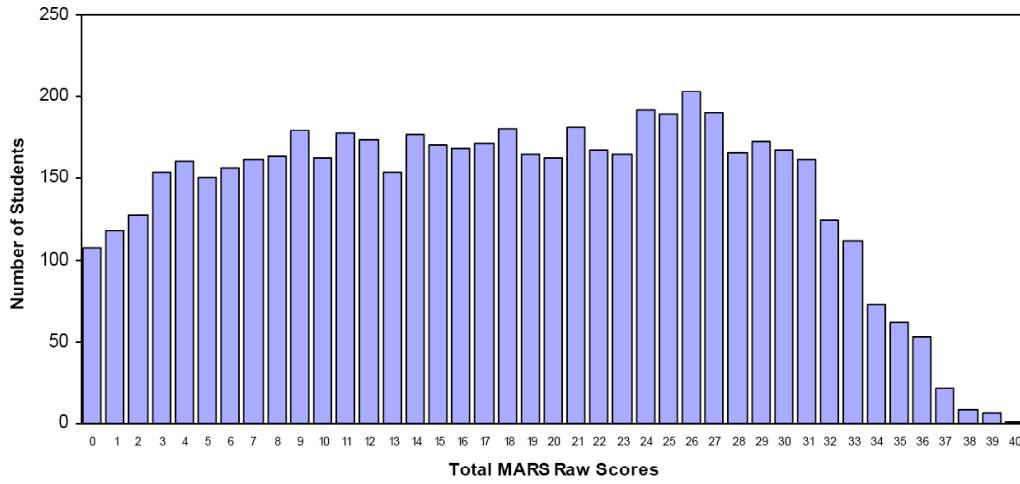


Figure 8: Overall Frequency Distribution by Total MARS Raw Scores, Course 1

Mean: 17.63 StdDev: 9.87



MARS Test Performance Level Frequency Distribution Table and Bar Graph
2007 - Number of Students tested in Course 1: 5744

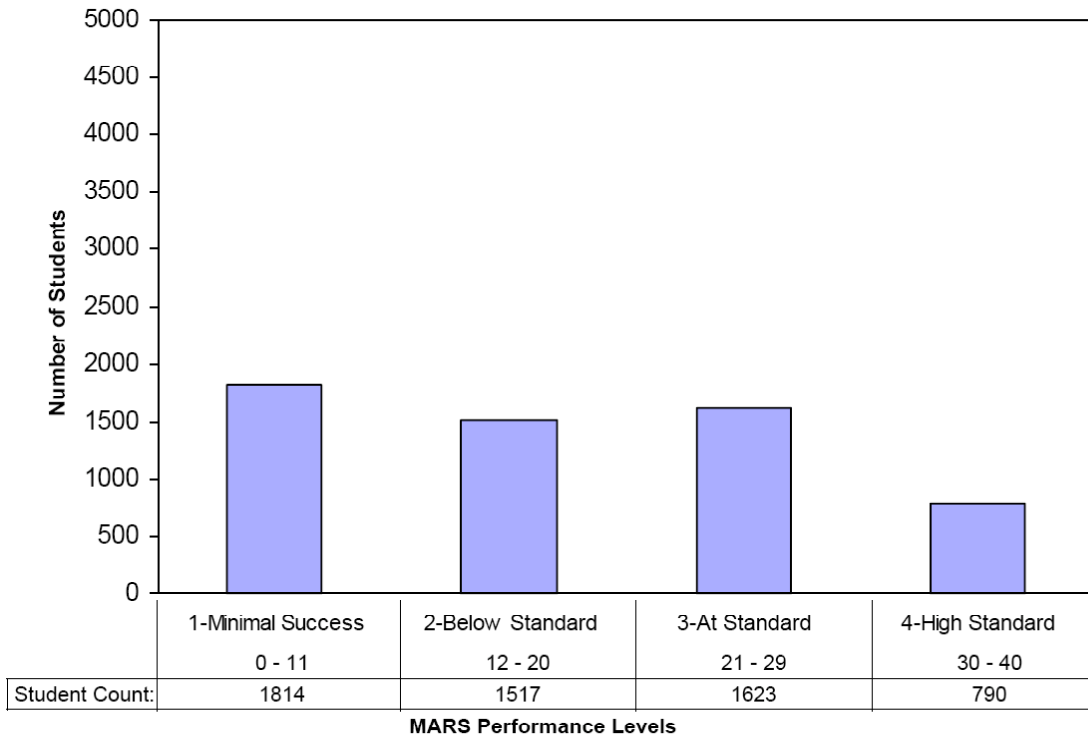
Table 8: Frequency Distribution of MARS Test Performance Levels, Course 1

Perf. Level	Year of Testing					
	2002		2003		2004	
	% at	% at least	% at	% at least	% at	% at least
1	18%	100%	66%	100%	39%	100%
2	61%	82%	29%	34%	39%	61%
3	20%	22%	5%	6%	19%	23%
4	2%	2%	1%	1%	3%	3%

Table 8 (Cont.): Frequency Distribution of MARS Test Performance Levels, Course 1

Perf. Level	Year of Testing					
	2005		2006		2007	
	% at	% at least	% at	% at least	% at	% at least
1	20%	100%	37%	100%	32%	100%
2	21%	80%	20%	63%	26%	68%
3	29%	59%	24%	42%	28%	42%
4	29%	29%	18%	18%	14%	14%

Figure 17: Bar Graph of 2007 MARS Test Performance Levels, Course 1



* Total MARS raw scores is the summation of Tasks 1 through 5 on the MARS test.

The following figures show the distribution of raw scores with the median represented as a horizontal bar in the center of the box, the interquartile range (25 percentile to 75 percentile) represented by the box, and the extreme values* within a category lie between the highest and lowest horizontal bars. Groups with Ns of less than 5 students are not reported.

Figure 8.1 Box and whisker plot of Total MARS Raw Scores by Ethnicity

Course: 1

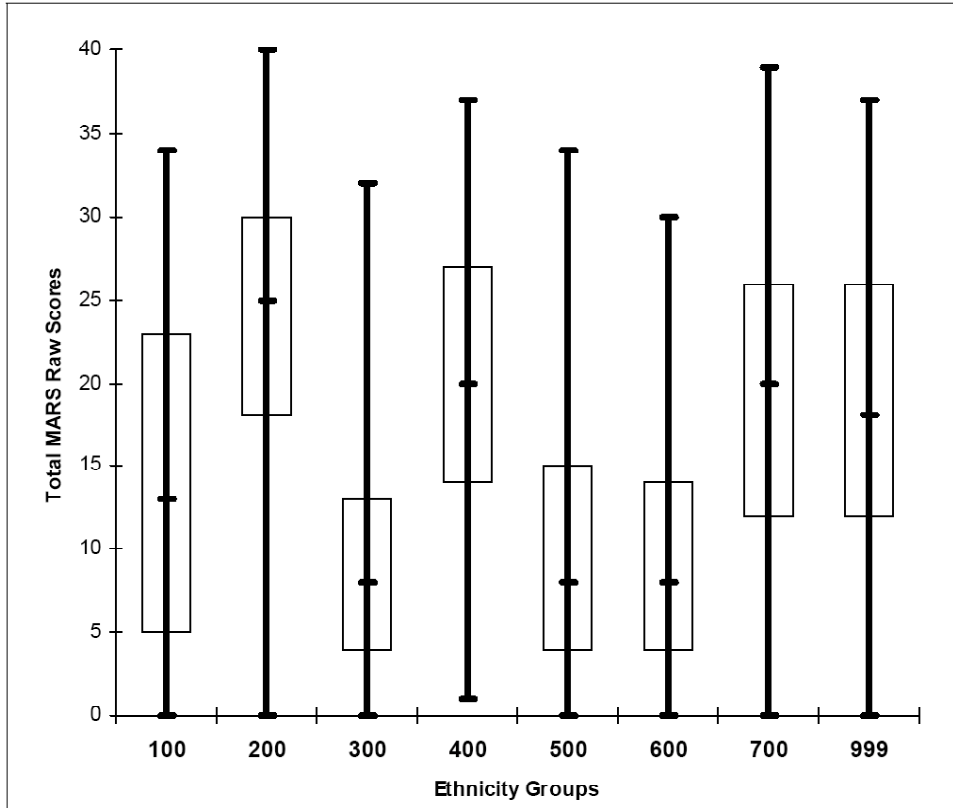


Table 8.1 Student count for Ethnicity

Ethnicity Groups	Ethnicity	Student Count
100	American Indian	25
200	Asian/Asian American	1209
300	Pacific Islander	87
400	Filipino	248
500	Hispanic/Latino	1039
600	African American	309
700	White (Not Hispanic)	2250
999	Decline to state	127

*Extremes are cases with values more than three box lengths from the upper or lower edge of the box.

Distribution of sampling means
Course 1
Ethnicity

In this section, test scores are compared across different ethnic groups¹. One way to look at the group differences is to study the graphs. If scores from group A are above and do not overlap scores from group B, then group A is significantly above group B. Conversely, if the scores from group A are below and do not overlap the scores from group B, then group A is significantly lower than group B. When the two scores overlap there is no significant difference between the groups.

The mean score of Asian/Asian American students is higher than the mean scores of all other ethnic groups. The scores of Filipino and White students are not different from one another, and are higher than the scores of Indian/Alaskan Native, Pacific Islander, Hispanic, and African American students.

Indian/Alaskan Native, Pacific Islander, Hispanic, and African American students are at the low end of the mean scores – significantly lower than Asian/Asian American, White and Filipino students – and their scores are not significantly different from one another.

¹ Overall comparisons were made using an Analysis of Variance (ANOVA) test. Comparisons between the groups were made using Tukey's honestly significant difference. All differences were significant at the .05 level.

Figure 17.1 Distribution of sampling means by Ethnicity

Course: 1

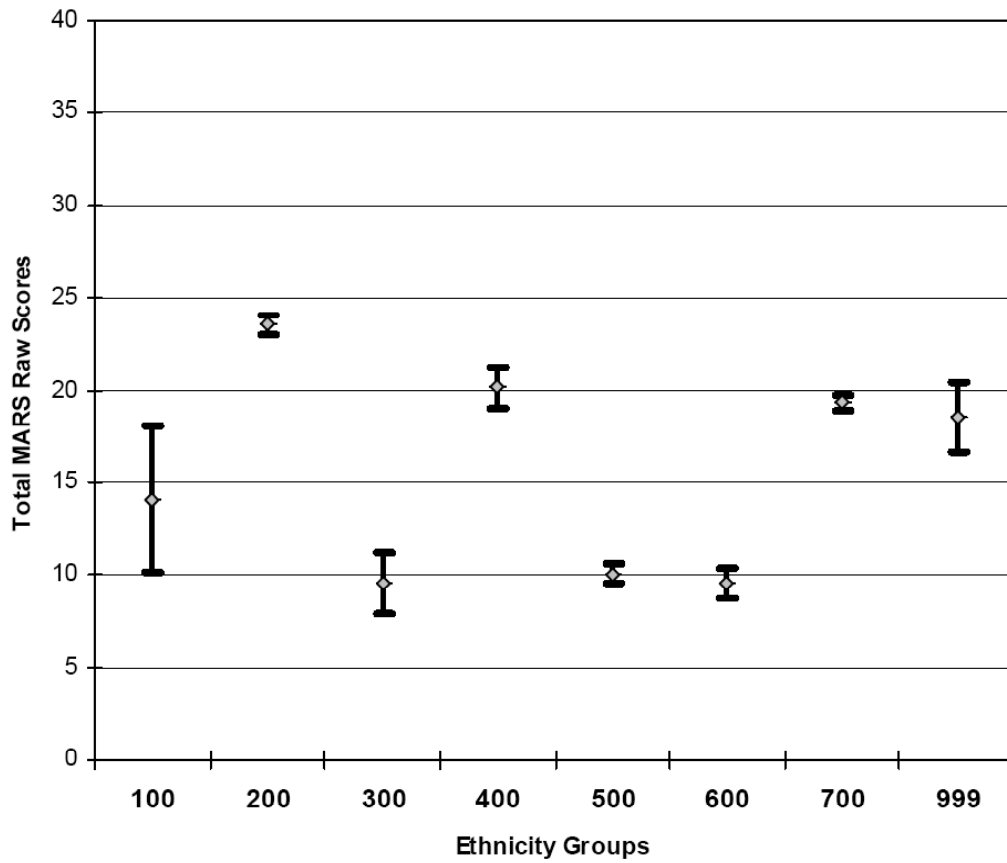


Table 17.1 Student count for Ethnicity

Ethnicity Groups	Ethnicity	Student Count
100	American Indian	25
200	Asian/Asian American	1209
300	Pacific Islander	87
400	Filipino	248
500	Hispanic/Latino	1039
600	African American	309
700	White (Not Hispanic)	2250
999	Decline to state	127

Figure 8.2 Box and whisker plot of Total MARS Raw Scores by Home Language
Course: 1

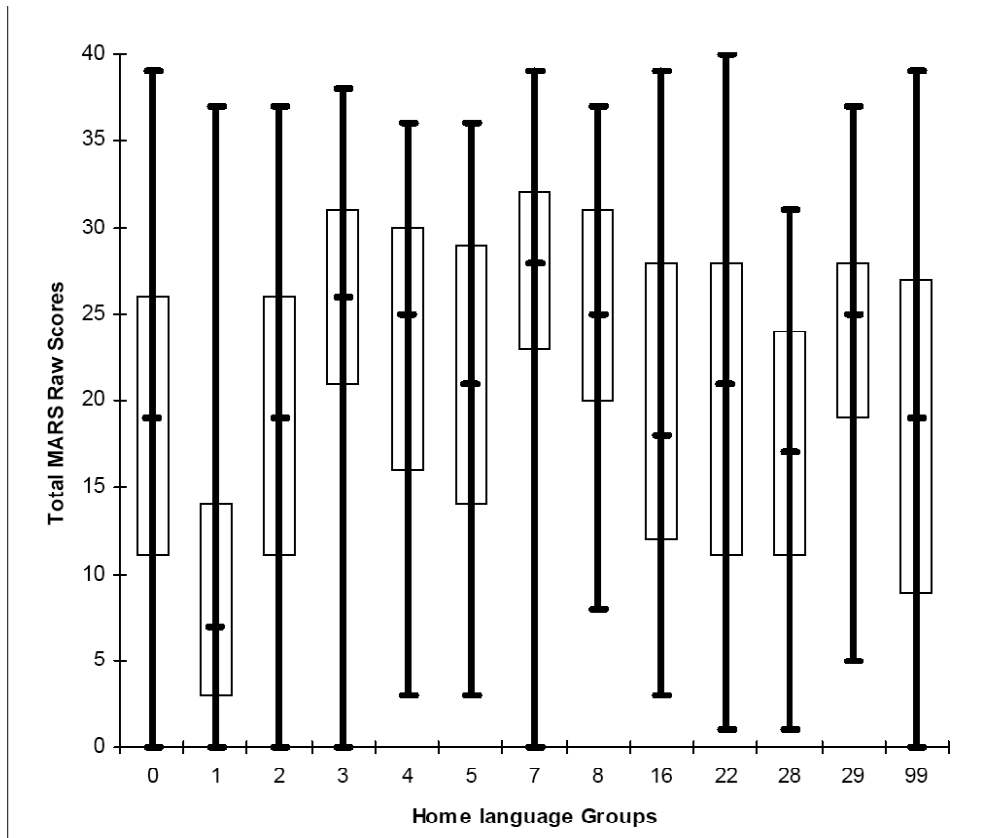


Table 8.2 Student count for Home Language

Home Language Group	Home Language	Student Count
0	English	3497
1	Spanish	707
2	Vietnamese	84
3	Cantonese	134
4	Korean	73
5	Filipino	91
7	Mandarin	222
8	Japanese	44
16	Farsi	35
22	Hindi	37
28	Punjabi	22
29	Russian	23
99	Others/Unknown	325

Distribution of sampling means
Course 1
Home Language

In this section, test scores are compared across groups of students who speak different languages at home². One way to look at the group differences is to study the graphs. If scores from group A are above and do not overlap scores from group B, then group A is significantly above group B. Conversely, if the scores from group A are below and do not overlap the scores from group B, then group A is significantly lower than group B. When the two scores overlap there is no significant difference between the groups.

The comparison by home language is complex because there are 13 language groups with large enough numbers in the data set to be included in the analysis. This section summarizes some of the key points in terms of significant differences among home language groups.

The students who speak Mandarin at home have significantly higher score means than all of the other home language groups except Cantonese, Japanese, and Russian (not significant). The mean score of Japanese speakers is significantly higher than that of English or Spanish speakers, and not significantly lower than any language group.

A large number of language groups have mean scores that are significantly higher than that of Spanish speakers, and significantly lower than Cantonese and/or Mandarin speakers. Included in this group are Vietnamese, Farsi, Hindi, Punjabi, Korean, and Filipino speakers.

Students who speak English at home have a mean score that is higher than the mean score of Spanish speakers, but lower than that of Mandarin, Korean, Cantonese and Japanese-speakers.

The students who speak Spanish at home have the lowest mean score, significantly lower than all other home language groups except Punjabi (not statistically significant).

² Overall comparisons were made using an Analysis of Variance (ANOVA) test. Comparisons between the groups were made using Tukey's honestly significant difference. All differences were significant at the .05 level.

Figure 17.2 Distribution of sampling means by Home Language
Course: 1

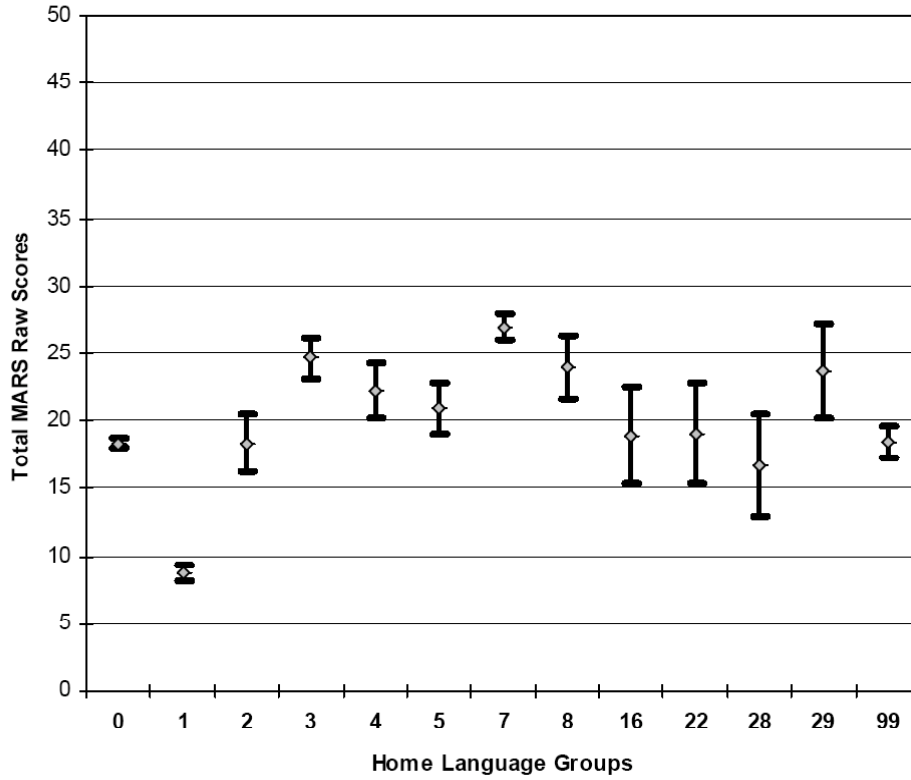


Table 17.2 Student count for Home Language

Home Language Group	Home Language	Student Count
0	English	3497
1	Spanish	707
2	Vietnamese	84
3	Cantonese	134
4	Korean	73
5	Filipino	91
7	Mandarin	222
8	Japanese	44
16	Farsi	35
22	Hindi	37
28	Punjabi	22
29	Russian	23
99	Others/Unknown	325

Figure 8.3 Box and whisker plot of Total MARS Raw Scores by Parent Education
Course: 1

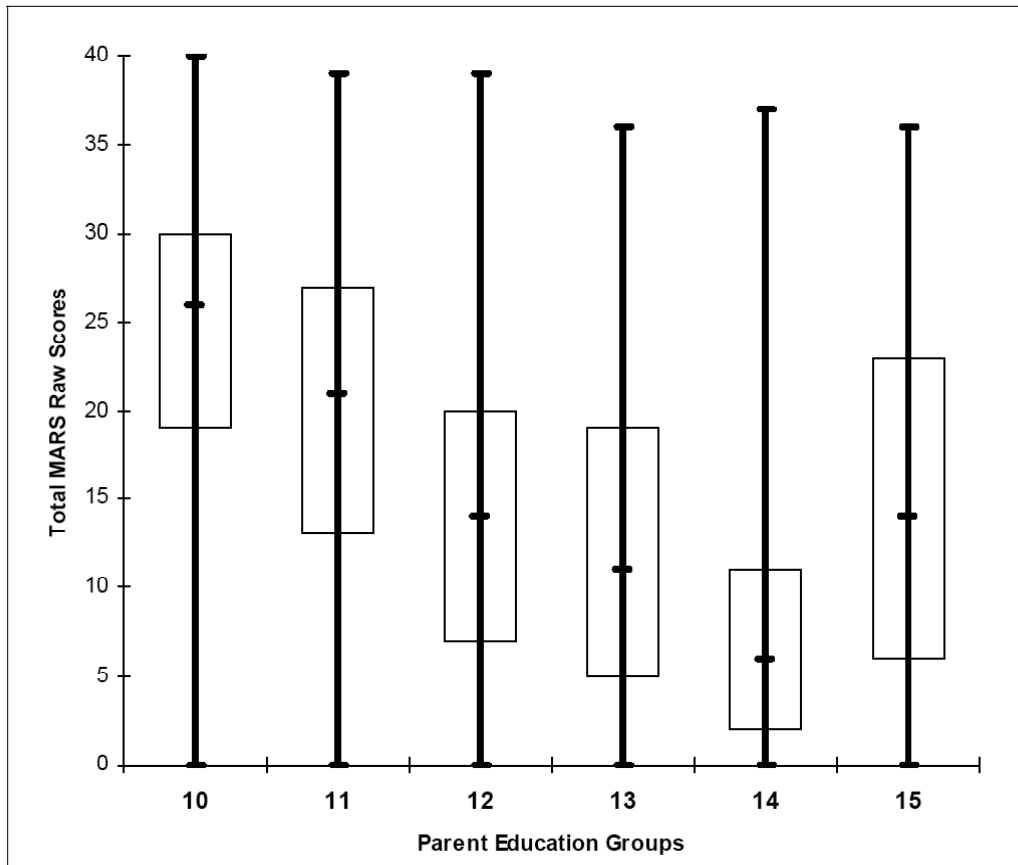


Table 8.3 Student count for Parent Education

Parent Education Group	Parent Education	Student Count
10	Graduate School	1341
11	College graduate	1540
12	Some college	938
13	High School graduate	689
14	Not a high school graduate	383
15	Others/Unknown	403

Distribution of sampling means
Course 1
Parent Education

In this section, test scores are compared across groups of students with different levels of parent education³. One way to look at the group differences is to study the graphs. If scores from group A are above and do not overlap scores from group B, then group A is significantly above group B. Conversely, if the scores from group A are below and do not overlap the scores from group B, then group A is significantly lower than group B. When the two scores overlap there is no significant difference between the groups.

The score means for groups whose parents had different levels of education fall as expected, with students whose parents have higher levels of education having significantly higher mean scores than students whose parents have lower levels of education. The scores of students whose parents have a graduate school education are higher than all other groups, followed by students whose parents are college graduates. Students whose parents have some college education have higher scores than students whose parents are high school graduates. Finally, the scores of students whose parents are not high school graduates are significantly lower than the scores of students in all other parent education categories.

³ Overall comparisons were made using an Analysis of Variance (ANOVA) test. Comparisons between the groups were made using Tukey's honestly significant difference. All differences were significant at the .05 level.

Figure 17.3 Distribution of sampling means by Parent Education
Course: 1

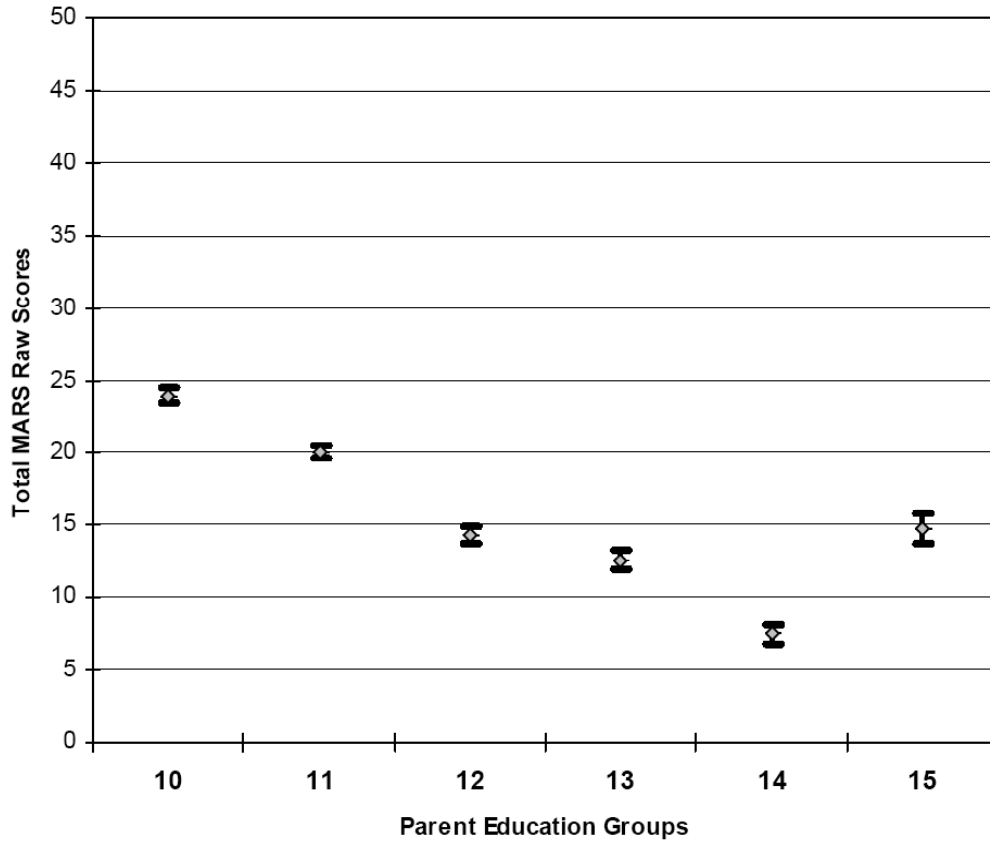


Table 17.3 Student count for Parent Education

Parent Education Group	Parent Education	Student Count
10	Graduate School	1341
11	College graduate	1540
12	Some college	938
13	High School graduate	689
14	Not a high school graduate	383
15	Others/Unknown	403

Figure 8.4 Box and whisker plot of Total MARS Raw Scores by Gender
Course: 1

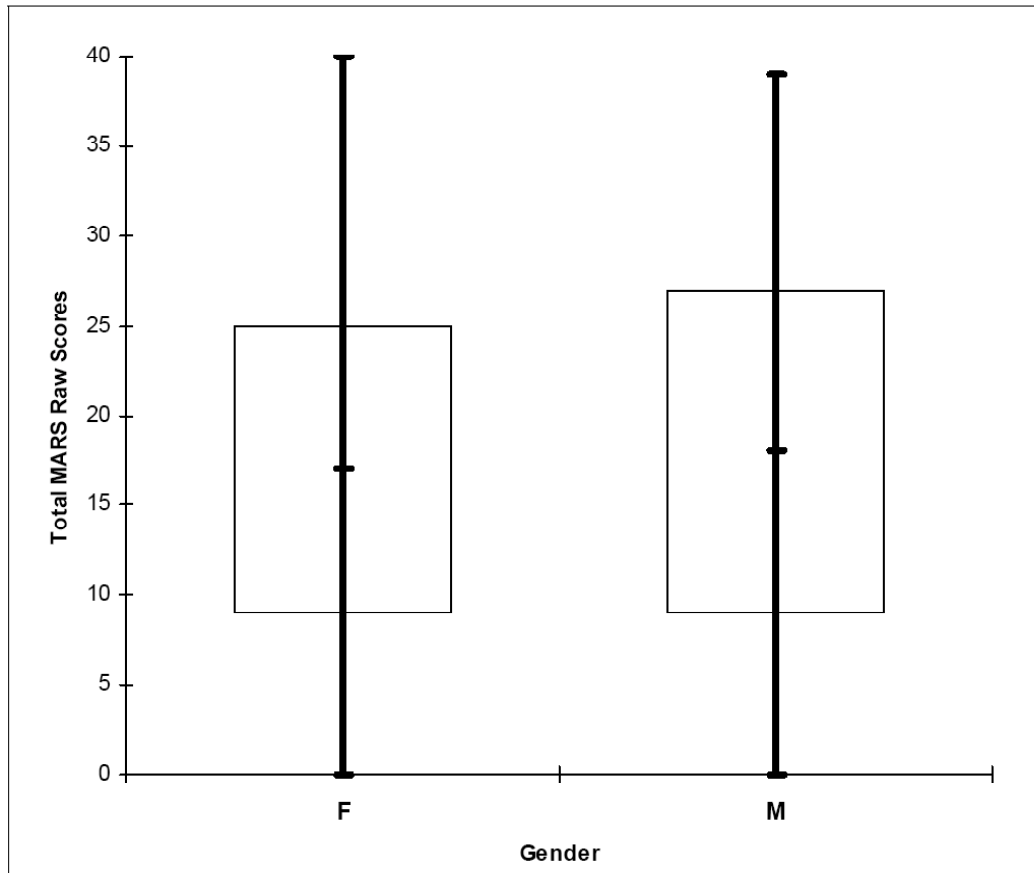


Table 8.4 Student count for Gender

Gender	Student Count
Female	2624
Male	2668

Distribution of sampling means
Course 1
Gender

In this section, test scores are compared across genders⁴. One way to look at the group differences is to study the graphs. If scores from group A are above and do not overlap scores from group B, then group A is significantly above group B. Conversely, if the scores from group A are below and do not overlap the scores from group B, then group A is significantly lower than group B. When the two scores overlap there is no significant difference between the groups.

The difference in mean scores for males and females is not statistically significant.

⁴ Overall comparisons were made using an Analysis of Variance (ANOVA) test. Comparisons between the groups were made using Tukey's honestly significant difference. All differences were significant at the .05 level.

Figure 17.4 Distribution of sampling means by Gender
Course: 1

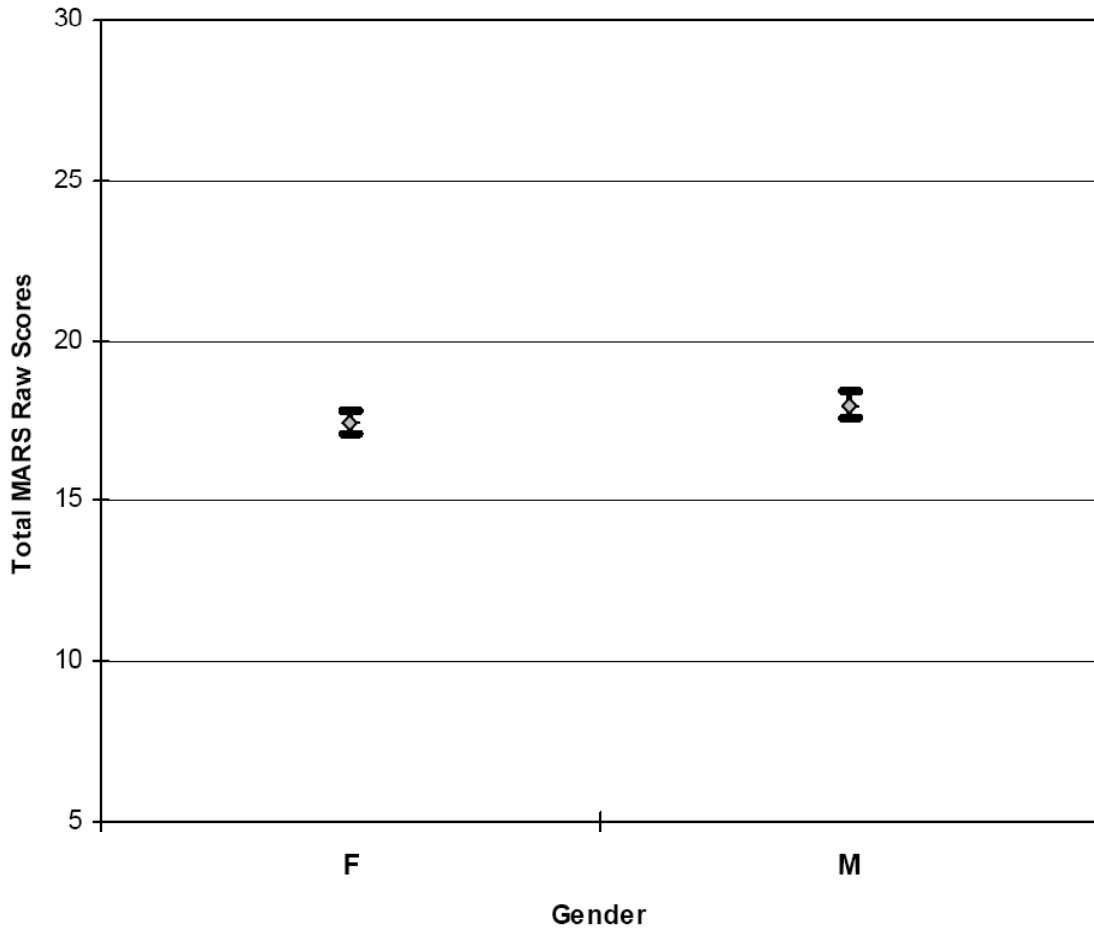


Table 17.4 Student count for Gender

Gender	Student Count
Female	2624
Male	2668

Figure 8.5 Box and whisker plot of Total MARS Raw Scores by Language Fluency Course: 1

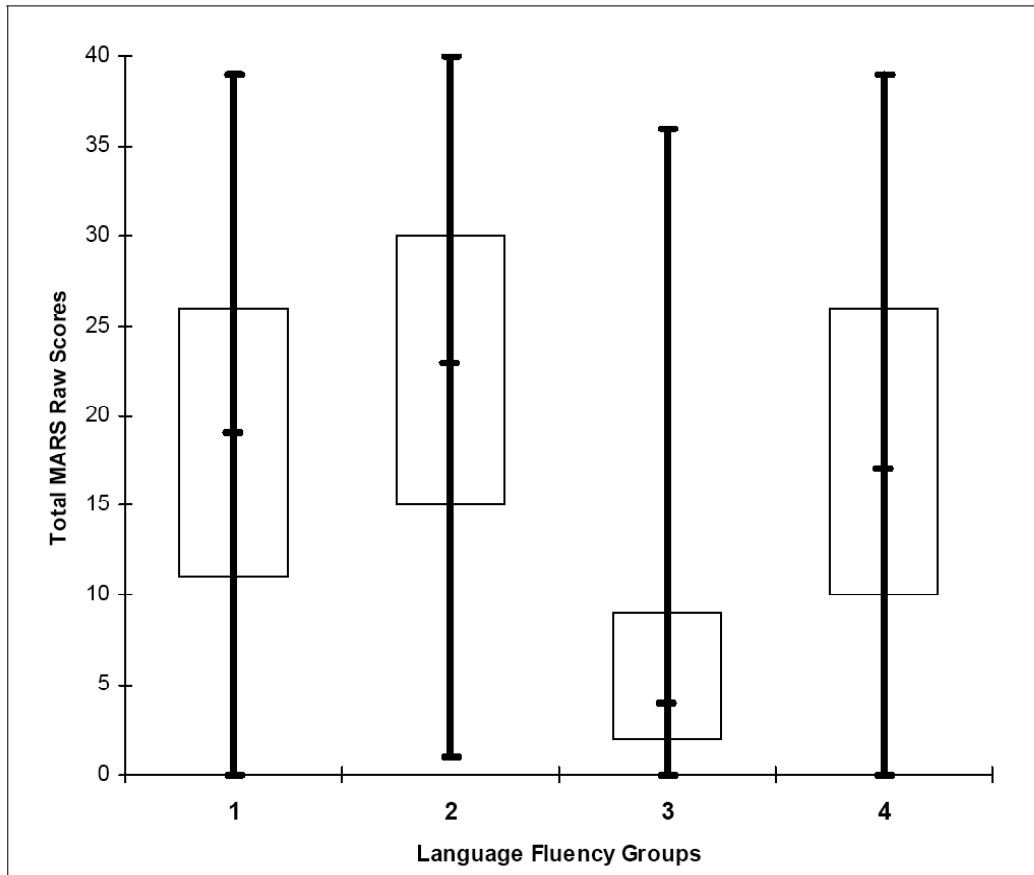


Table 8.5 Student count for Language Fluency

Language Fluency Group	Language Fluency	Student Count
1	English only	3442
2	Initially Fluent (I-FEP)	656
3	English Learner	446
4	ReDesignated (R_FEP)	746

Distribution of sampling means
Course 1
Language Fluency

In this section, test scores are compared across different English language proficiency groups⁵. One way to look at the group differences is to study the graphs. If scores from group A are above and do not overlap scores from group B, then group A is significantly above group B. Conversely, if the scores from group A are below and do not overlap the scores from group B, then group A is significantly lower than group B. When the two scores overlap there is no significant difference between the groups.

Students who are classified as FEP have a higher mean score than all other groups, and English learners are significantly lower than all other groups. The mean scores of English only and R-FEP students are not significantly different from each other.

⁵ Overall comparisons were made using an Analysis of Variance (ANOVA) test. Comparisons between the groups were made using Tukey's honestly significant difference. All differences were significant at the .05 level.

Figure 17.5 Distribution of sampling means by Language Fluency

Course: 1

Language Fluency

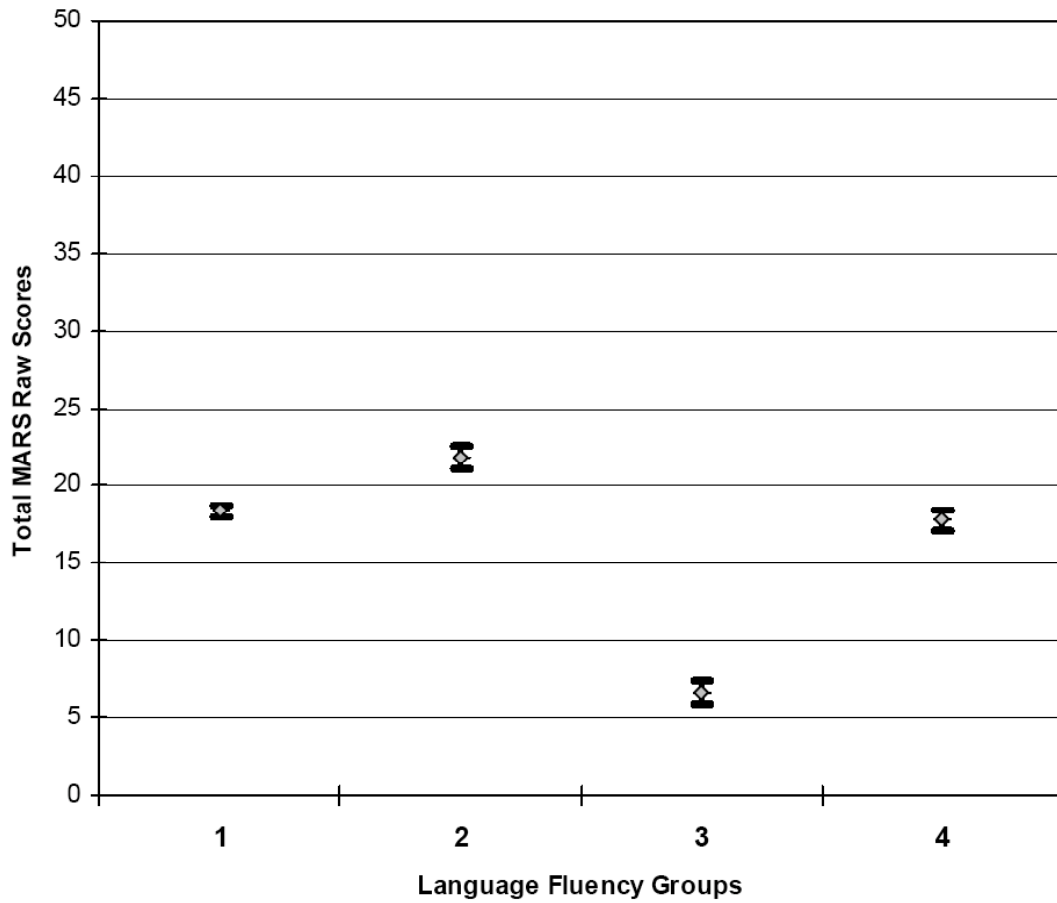


Table 17.5 Student count for Language Fluency

Language Fluency Group	Language Fluency	Student Count
1	English only	3442
2	Initially Fluent (I-FEP)	656
3	English Learner	446
4	ReDesignated (R_FEP)	746

Course One – Algebra

Balanced Assessment Test –Algebra 2007

Core Idea	Task	Score
Functions	Graphs	
<p>This task asks students to match linear and quadratic equations with their graphs. Interpret the meaning of the intersections of the two lines, graph the equation $y=3x$, and read points off the graph. Successful students could use algebra to find the intersecting points by writing and solving an equation.</p>		
Data Analysis	House Prices	
<p>This task asks students to work with scatterplots in the context of wages and house prices. Students were asked to make a general statement about the correlation of the variables in each scatterplot, read points from the graph, and identify outliers. Successful students could give an equation for the graph with a positive correlation and show the location on the graph where house payments exceeded monthly income.</p>		
Mathematical Reasoning	Ash’s Puzzle	
<p>This task asks students to investigate and find numbers that fit a given set of rules and write rules to describe how to find numbers with certain characteristics. Successful students could consider all or most possibilities.</p>		
Algebraic Properties and Representations	How Old Are They?	
<p>This task asks students to form algebraic expressions to describe relationships between the ages of some children, use these expressions to write and solve equations to find their ages, and solve for the time when one child will be twice as old as the other child.</p>		
Algebra	Two Solutions	
<p>This task asks students to find two possible solutions to a variety of types of equations, such as $121=x^2$ and $x^2 < x^3$. Students are then asked to sort equations into those with only 2 solutions, more than 2 solutions, and an infinite number of solutions. Successful students could solve the equations, use substitution, and had other strategies to help them find the two solutions.</p>		

MARS Test Task 1 Frequency Distribution and Bar Graph, Course 1

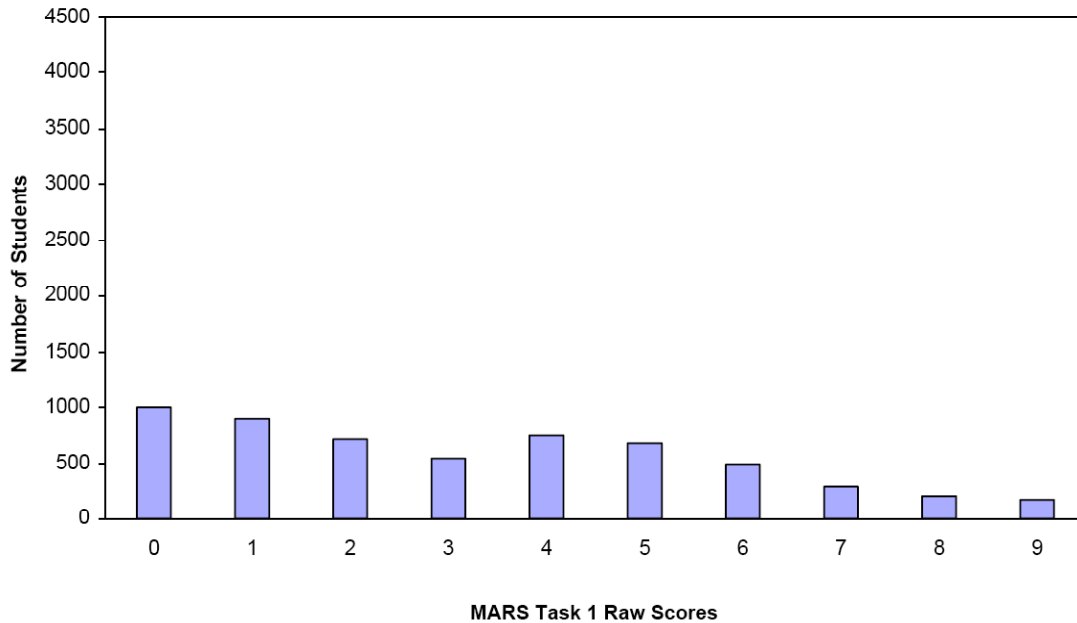
Task 1 - Graphs

Mean: 3.23 StdDev: 2.54

Table 45: Frequency Distribution of MARS Test Task 1, Course 1

Task 1 Scores	Student Count	% at or below	% at or above
0	1003	17.5%	100.0%
1	892	33.0%	82.5%
2	714	45.4%	67.0%
3	543	54.9%	54.6%
4	746	67.9%	45.1%
5	676	79.6%	32.1%
6	500	88.3%	20.4%
7	292	93.4%	11.7%
8	202	96.9%	6.6%
9	176	100.0%	3.1%

Figure 54: Bar Graph of MARS Test Task 1 Raw Scores, Course 1



The maximum score available for this task is 9 points.

The minimum score for a level 3 response, meeting standards, is 4 points.

Most students, 83%, could identify the coordinates for the points of intersection of the two graphs. More than half the students, 67%, could identify the equations with their graphs and find the points of intersection. Almost half the students, 45%, could also draw a graph of $y=3x$ and find the coordinates where it intersects with $y=x^2$. About 9% of the students could meet most of the demands of the task, but struggled with locating the coordinates of intersection for $y=x^2$ and $y=3x$ giving values for x in part 2. Almost 18% of the students scored no points on this task. 95% of the students in the sample with this score attempted the task.

MARS Test Task 2 Frequency Distribution and Bar Graph, Course 1

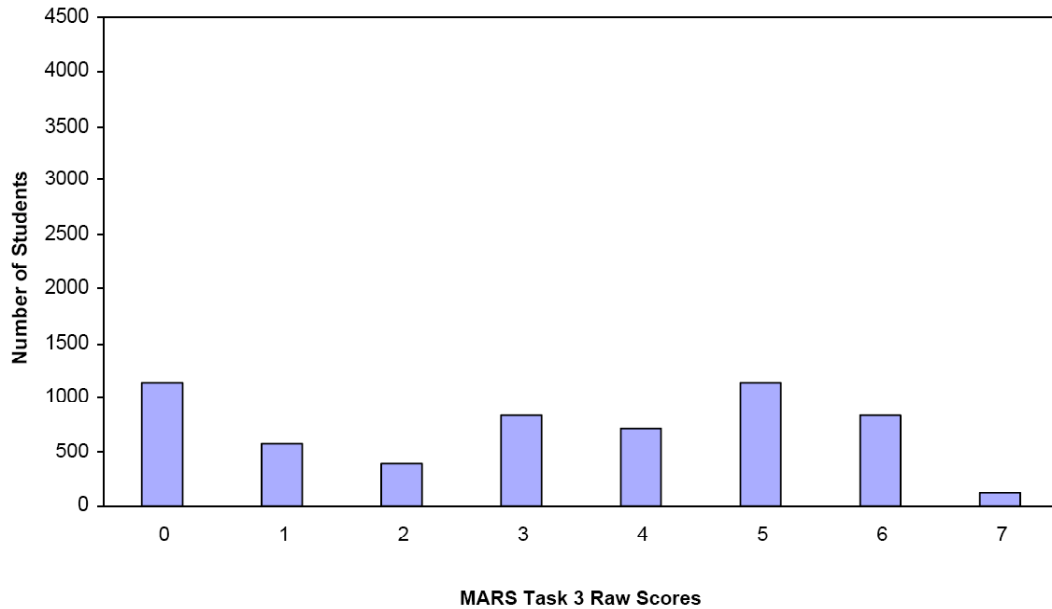
Task 2 - House Prices

Mean: 3.50 StdDev: 1.75

Table 46: Frequency Distribution of MARS Test Task 2, Course 1

Task 2 Scores	Student Count	% at or below	% at or above
0	400	7.0%	100.0%
1	445	14.7%	93.0%
2	766	28.0%	85.3%
3	1004	45.5%	72.0%
4	1284	67.9%	54.5%
5	1208	88.9%	32.1%
6	495	97.5%	11.1%
7	142	100.0%	2.5%

Figure 56: Bar Graph of MARS Test Task 3 Raw Scores, Course 1



The maximum score available for this task is 7 points.

The minimum score for a level 3 response, meeting standards, is 4 points.

Most students, 93%, could either find the monthly payment from the graph or could state that there was no pattern to the second scatterplot. About half the students, 55%, could explain the trend of the first graph, find the monthly payment, and locate the two points on the second graph for easiest and most difficult to afford. Some students, about 32%, could also describe the randomness of the second scatterplot. A few students, about 11% could also write a formula for a line on graph. Only 2.5% of the students could meet all the demands of the task including graphing and labeling an inequality on a graph. 7% of the students scored no points on the task. 75% of the students with this score attempted the task.

MARS Test Task 3 Frequency Distribution and Bar Graph, Course 1

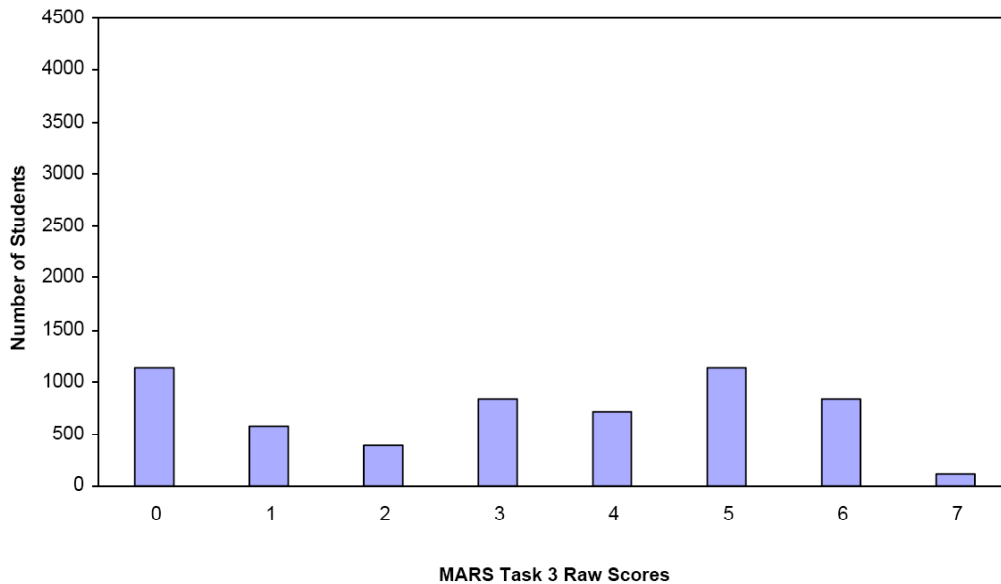
Task 3 - Ash's Puzzle

Mean: 3.18 StdDev: 2.19

Table 47: Frequency Distribution of MARS Test Task 3, Course 1

Task 3 Scores	Student Count	% at or below	% at or above
0	1132	19.7%	100.0%
1	585	29.9%	80.3%
2	394	36.8%	70.1%
3	824	51.1%	63.2%
4	713	63.5%	48.9%
5	1143	83.4%	36.5%
6	826	97.8%	16.6%
7	127	100.0%	2.2%

Figure 56: Bar Graph of MARS Test Task 3 Raw Scores, Course 1



The maximum score available on this task is 7 points.

The minimum score for a level 3 response, meeting standards, is 4 points.

Many students could find one solution of adding 9 to a two-digit number that would reverse the digits. More than half the students, 63%, could find one solution for reversing a two digit number and four examples for reversing a three digit number and give supporting evidence to verify the solutions. Almost half the students could also find at least 5 solutions for reversing the two-digit number. About 16% could find all the solutions for reversing the 2 digit number and could verbalize a rule about the units digit being one larger than the hundreds unit. About 2% of the students could meet all the demands of the task including noticing that the middle digit could be any number from 0 to 9. Almost 20% of the students scored no points on this task. 76% of the students with this score attempted the task.

MARS Test Task 4 Frequency Distribution and Bar Graph, Course 1

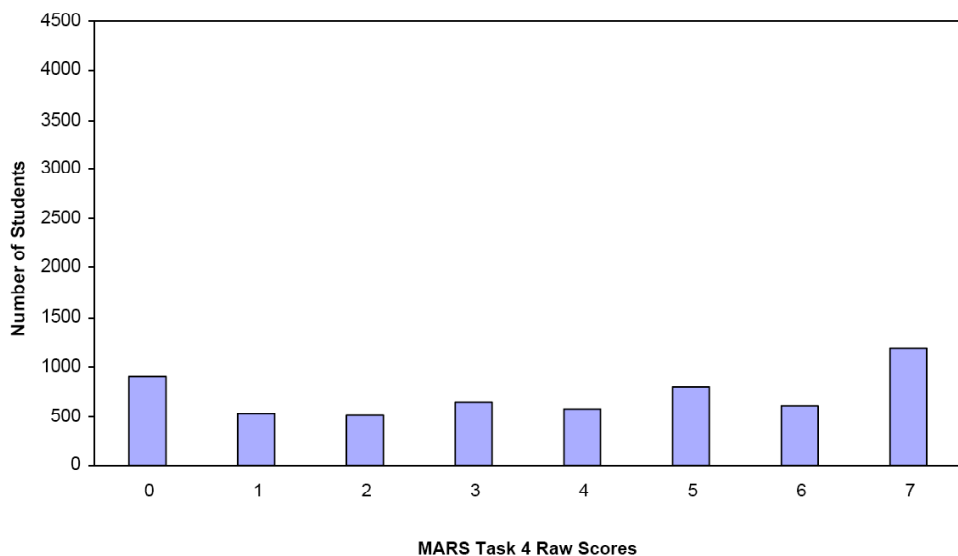
Task 4 - How Old are They?

Mean: 3.79 StdDev: 2.48

Table 48: Frequency Distribution of MARS Test Task 4, Course 1

Task 4 Scores	Student Count	% at or below	% at or above
0	898	15.6%	100.0%
1	520	24.7%	84.4%
2	502	33.4%	75.3%
3	649	44.7%	66.6%
4	572	54.7%	55.3%
5	803	68.7%	45.3%
6	610	79.3%	31.3%
7	1190	100.0%	20.7%

Figure 57: Bar Graph of MARS Test Task 4 Raw Scores, Course 1



The maximum score available for this task is 7 points.

The minimum score for a level 3 response, meeting standards, is 5 points.

Most students, 84%, were able to write an algebraic expression for an additive relationship. More than half the students, 66%, could write an additive expression and find the ages for the 3 students which met all the constraints of the problem. Almost half the students, 45%, could write an expression for an additive relationship, find the ages of the 3 students, and find a strategy to correctly calculate the time when Jan will be twice as old as Will. Almost 21% of the students could meet all the demands of the task including writing a multiplicative relationship involving distributive property and writing and solving an equation to find the ages of the 3 children. Almost 16% of the students scored no points on this task. 69% of the students with this score attempted the task.

MARS Test Task 5 Frequency Distribution and Bar Graph, Course 1

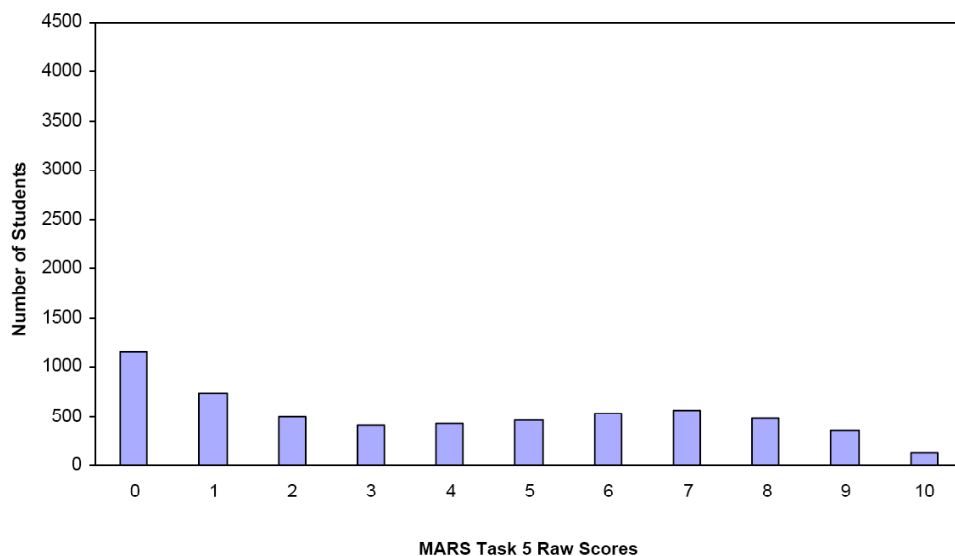
Task 5 - Two Solutions

Mean: 3.93 StdDev: 3.15

Table 49: Frequency Distribution of MARS Test Task 5, Course 1

Task 5 Scores	Student Count	% at or below	% at or above
0	1156	20.1%	100.0%
1	725	32.7%	79.9%
2	486	41.2%	67.3%
3	416	48.5%	58.8%
4	430	55.9%	51.5%
5	461	64.0%	44.1%
6	522	73.1%	36.0%
7	562	82.8%	26.9%
8	480	91.2%	17.2%
9	362	97.5%	8.8%
10	144	100.0%	2.5%

Figure 58: Bar Graph of MARS Test Task 5 Raw Scores, Course 1



The maximum score available for this task is 10 points.

The minimum score for a level 3 response, meeting standards, is 5 points.

Many students, almost 80%, could find both solutions for $x^2=121$ or find two solutions for $1776x + 1066 \geq 365$. About half the students could also find $x^2 > x^3$ and for $|x| > x$. Less than half the students could also identify two equations that had an infinite number of solutions. About 8% of the students could meet most of the demands of the tasks, but may have struggled with finding or explaining why an equation would have more than two solutions, but not an infinite number of solutions. 20% of the students scored no points on this task. 42% of the students with this score attempted the task.

Some students at this level are still struggling with computational issues: using exponents and order of operations. For the Collaborative as a whole, three big algebraic ideas stand out.

1. Understanding Variables to Describe Relationships - Students struggled with writing algebraic expressions to describe basic relationships when given a problem in context. In Graphs students could generally match graphs with equations, but had difficulty matching graphs or equations with descriptions of the context. In House Prices students often used the variable as a label when trying to write equations connecting House Price with payments or tried to give specific values for the variable instead of describing a constant relationship that would hold true for a range of values. In the task, How Old are They?, students tried to use too many variables for the situation, gave specific values instead of writing expressions, used the variable as a label, changed the meaning of the variable in different parts of the task.
2. Understanding Equalities – Students could not set up equalities in Graphs to find the points where two lines intersected or couldn't use algebra to solve the equalities. In House Prices students didn't think about finding the line where house payment equals income to help identify the area or inequality where the house payment would be larger than the income. In How Old are They? students had trouble thinking about changing Jan and Will's age and equal amount. They often wanted to age only one of the two students. Students also didn't think about how to use this change to set up an equality or equation that will help them solve the task.
3. Thinking about Cases of Numbers or Number Properties – In Ash's Puzzle students needed to think about different cases of numbers in order to make a generalization. Students frequently did not explore enough options before trying to jump to the generalization. In Two Solutions students needed to think about under the conditions or cases of numbers for which a statement would be true. Would this work for positive numbers? Would this work for 0? Would this work for fractions? What properties of these subsets make the conditions true?