FINDINGS OF THE
1999 PLAIN LANGUAGE FIELD TEST

INCLUSIVE COMPREHENSIVE ASSESSMENT SYSTEM

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INTRODUCTION

During the 1999 Plain Language Field Test, two versions of the mathematics assessment and the science assessment were administered to 462 students – 301 fifth grade students and 161 eighth grade students. Each version consisted of a variety of grade-appropriate multiple choice, short answer, and open-ended items (see Appendix G). One version, which will be called the "original" version, contains items in their original format. The other version, which will be called the "Plain Language" version, incorporated the features of Plain Language translation. The items on the two versions are identically in every other respect.

"Plain Language is text-based language that is straightforward, concise, and uses everyday words to convey meaning. The goal of Plain Language editing strategies is to improve the comprehensibility of written text while preserving the essence of its message. Greater clarity may be achieved, for instance, by reducing text length, removing esoteric jargon, and/or adding illustrations to aid the reader in her understanding of written information." (Hanson, Hayes, Schriver, LeMahieu, and Brown, 1998, p. 2-3). See Table 1 for a more complete list of the features of language or graphics to consider when doing Plain Language translation.

METHODOLOGY

The purpose of this study is to identify any significant differences in the performance of students when assessment items are presented in the Plain Language format as compared to the original format of the item. For some items, the changes made to incorporate the Plain Language concept were substantial while for other items the changes were minimal. Initially, all items, original and Plain Language, were reviewed by a panel of mathematics and science experts to confirm that each pair of items was measuring the same construct. After administration, a more

Table 1
<u>Plain Language Editing Strategies</u>

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1. **Reduce excessive length.** Reduce wordiness and remove irrelevant material. Where possible, replace compound and complex sentences with simple ones.

2. **Eliminate unusual or low-frequency words and replace with common words.** For example, replace "utilize" with "use."

3. **Avoid ambiguous words.** For example, "crane" could be a bird or a piece of heavy machinery.

4. **Avoid irregularly spelled words.** For example, "trough" and "feign."

5.   **Avoid proper names.** Replace proper names with simple, common names such as first names.

6. **Avoid inconsistent naming and graphic conventions.** Avoid multiple names for the same concept. Be consistent in the use of typeface.

7. **Avoid unclear signals about how to direct attention.** Well-designed headings and graphic arrangement can convey information about the relative importance of information and order in which it should be considered. For example, phrases such as "in the table below,…" can be helpful.

8. **Mark all questions.** When asking more than one question, be sure that each is specifically marked with a bullet, letter, number, or other obvious graphic signal.

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detailed analysis was conducted to identify if these changes improve or hinder the performance of students with disabilities. Therefore, for this analysis, students were categorized as "regular education students" or "special education students." Furthermore, very few students (n = 35) in this study were considered Limited English Proficient (LEP) students and thus, the reader should be cautious about making any inferences about the analyses for these students.

For this study, a random sample of 836 fifth grade students and 758 eighth grade students was drawn from 30 schools across six school districts throughout Delaware. Consent forms were mailed to the parents of these students. Almost half (42%) of the parents of fifth grade students and slightly more than one-quarter (28%) of the parents of eighth grade students returned the consent forms. Most parents (90% percent of the parents of 5th grade students and 80% of the parents of 8th grade students) who returned the consent forms gave permission for their son or daughter to participate in this research study. A few of these students (n = 29) were unable to participate due to their absence on the day of the testing. Table 2 contains various pieces of demographic information on the students that participated in this study. These demographic variables include grade level, form completed, and special education classification.

Table 2
Number of Students Who Completed the Assessment by Content, Form, Grade Level, and Education Classification

Content	Grade	Form	Regular Education Students	Special Education Students	Limited English Proficient (LEP) Students	Totals
Science	5th	Original	80	66	13	159
		Plain Language	95	60	16	171
	8th	Original	50	28	2	80
		Plain Language	58	24	4	86
Math	5th	Original	82	64	11	157
		Plain Language	93	62	18	173
	8th	Original	47	31	2	80
		Plain Language	61	21	4	86

FINDINGS

Initially, a total score was computed for each student. This total score is the summation of the scores received for each individual item on the assessment. Each correct response to a multiple choice item received one point. Each open-ended item was scored by two independent raters using a 4-point rubric. Therefore, the total score on any given open-ended item was a maximum of 8 points. Table 3 provides a summary of the type of items on each assessment administered.

Table 3
Description of Mathematics and Science Assessments Administered

	Grade Level of Students	Number of Items	Type of Items	Total Score Possible
Mathematics	5th	9	Open-ended	72
	8th	9	Open-ended (& multiple choice on Plain Language version only)	72
Science	5th	7	4 open-ended & 3 multiple choice	35
	8th	9	5 open-ended & 4 multiple choice	44

At each grade level, a t-test was performed to identify any significant differences between the performance of students completing the original version and the performance of students completing the Plain Language version for each sub-population – regular education students, special education students, and Limited English Proficiency students – in science. The results of

these tests are shown in Tables 4 - 9. These same analyses were conducted for their performance

in mathematics. The results of these tests are shown in Tables 10 - 15.

Table 4

T-Test Results on Total Score by Science Version Administered for Regular Education Students

Grade	t	df	Mean Difference
5th	-.76	173	-.58
8th	-.60	106	-.89

Table 5
Mean Scores (and Standard Deviation) on Science Assessment for Plain Language and Original
Version for Regular Education Students

	Original Version	Plain Language Version
Grade 5	17.60 (5.08)	18.18 (5.00)
Grade 8	19.28 (7.62)	20.17 (7.87)

Table 6

T-Test Results on Total Score by Science Version Administered for Special Education Students

Grade	t	df	Mean Difference
5th	1.06	97.55	1.03
8th	-.69	50	-1.20

Table 7
Mean Scores (and Standard Deviation) on Science Assessment for Plain Language and Original
Version for Special Education Students

	Original Version	Plain Language Version
Grade 5	14.18 (4.06)	13.15 (6.46)
Grade 8	11.96 (5.81)	13.17 (6.81)

Table 8

T-Test Results on Total Score by Science Version Administered for LEP Students

Grade	t	df	Mean Difference
5th	-.23	27	-.50
8th	-.93	4	-3.50

Table 9

Mean Scores (and Standard Deviation) on Science Assessment for Plain Language and Original Version for LEP Students

	Original Version	Plain Language Version
Grade 5	16.00 (5.02)	16.50 (6.58)
Grade 8	10.50 (6.36)	14.00 (3.37)

Table 10

T-Test Results on Total Score by Mathematics Version Administered for Regular Education Students

Grade	t	df	Mean Difference
5th	.51	173	1.01
8th	.60	106	1.61

Table 11

Mean Scores (and Standard Deviation) on Mathematics Assessment for Plain Language and Original Version for Regular Education Students

	Original Version	Plain Language Version
Grade 5	37.20 (14.02)	36.18 (12.45)
Grade 8	26.30 (13.72)	24.69 (13.94)

Table 12

T-Test Results on Total Score by Mathematics Version Administered for Special Education Students

Grade	t	df	Mean Difference
5th	.732	119.06	1.78
8th	.15	50	.39

Table 13

Mean Scores (and Standard Deviation) on Mathematics Assessment for Plain Language and Original Version for Special Education Students

	Original Version	Plain Language Version
Grade 5	27.35 (15.18)	25.58 (11.95)
Grade 8	15.58 (8.20)	15.19 (10.16)

Table 14

T-Test Results on Total Score by Mathematics Version Administered for LEP Students

Grade	t	df	Mean Difference
5th	.85	27	4.32
8th	-.93	4	-9.75

Table 15

Mean Scores (and Standard Deviation) on Mathematics Assessment for Plain Language and Original Version for LEP Students

	Original Version	Plain Language Version
Grade 5	33.55 (14.47)	29.22 (12.47)
Grade 8	9.50 (2.12)	19.25 (13.87)

These results show that there are no significant differences between the performance of students who completed the original version versus the performance of students who completed the Plain Language version for any sub-population of students in mathematics or science at either

fifth or eighth grade. The mean difference between the performance of a student on one version compared to the other version is less than two points in every case with the exception of LEP students on the mathematics assessment.

Furthermore, a chi-square analysis was conducted at the item level to identify if there were any significant differences between the performance of students who completed the original version versus the performance of students who completed the Plain Language version for each content area and at each grade level for each sub-population of students. These results are presented in Tables 16 - 27.

<div align="center">Science Assessment</div>

At the fifth grade level, these results show that there are significant differences between the performance of students who completed the original version versus the performance of students who completed the Plain Language version for very few of the items. However, due to chance factors, one would expect to detect a significant difference when one did not occur in about 5% of the items. Therefore, since only one item for each sub-population showed significant differences, one could conclude that there are no real differences between performance of fifth grade students who completed the original version versus the performance of fifth grade students who completed the Plain Language version on the science assessment. On the other hand, since the sample size was small especially for the LEP population, the differences would need to be large to detect them. Therefore, it is worth exploring the differences that were detected. For the regular education population, Soil 3 was the only item that showed significant differences. For this item, students who completed the original version were more likely to leave

Table 16
Chi-Square Values on Grade 5 Science Assessment for Plain Language and Original Version for Regular Education Students

Item	χ^2	df	n
Food	5.17	6	175
Box A	.39	1	175
Box C	8.69	8	175
Soil 1	.18	1	175
Soil 2	.42	1	175
Soil 3	11.66*	5	175
Insects	2.49	7	175

Table 17
Chi-Square Values on Grade 5 Science Assessment for Plain Language and Original Version for Special Education Students

Item	χ^2	df	n
Food	13.11	7	126
Box A	.10	1	126
Box C	12.93	7	126
Soil 1	1.05	1	126
Soil 2	.02	1	126
Soil 3	4.65	5	126
Insects	16.44*	7	126

Table 18
Chi-Square Values on Grade 5 Science Assessment for Plain Language and Original Version for LEP Students

Item	χ^2	df	n
Food	5.58	5	29
Box A	.12	1	29
Box C	6.86	6	29
Soil 1	1.09	1	29
Soil 2	.17	1	29
Soil 3	2.27	4	29
Insects	14.46*	7	29

* $p < .05$

the item blank than those students who completed the Plain Language version. For those students who did attempt the item, there was very little difference in the low to middle range of scores. However, students who completed the Plain Language version were more likely to receive a very high score as compared to those who completed the original version.

For the special education and LEP student population, Insects was the only item that showed significant differences. In both of these sub-populations, students who completed the Plain Language version were more likely to leave the item blank. However, for those students who did attempt the item, there was much greater variability in their scores if they completed the Plain Language version. For example, those who completed the original version were more likely to receive a low or average score while those who completed the Plain Language version received scores across the entire score range. Therefore, the Plain Language version seems to be able to differentiate among students' performance better than the original version of the item.

At the eighth grade level, these results show that there are significant differences between the performance of students who completed the original version versus the performance of students who completed the Plain Language version for two of the items, but for the regular education student population only. For one of the items, Phylum 1, students who completed the original version of the assessment were about three times more likely to leave the item blank than students who completed the Plain Language version of the assessment. For the other item, Phylum 2, while there was little difference in the likelihood of leaving the item blank, there were differences in performance across the two versions. For example, there was little difference between the percentage of students receiving low scores on this item, those student who completed the Plain Language version were more likely to do very well as compared to their counterparts completing the original version. That is, for the students who knew the science to

complete this item, the Plain Language version enhanced their ability to demonstrate what they knew. However, for students who did not have very much science knowledge to complete this item, there was no benefit to completing the Plain Language version rather than the original version.

Table 19
Chi-Square Values on Grade 8 Science Assessment for Plain Language and Original Version for Regular Education Students

Item	χ^2	df	n
Animal 1	.96	1	108
Animal 2	1.32	1	108
Rocks	7.13	7	108
Water	6.61	8	108
Fish 1	.06	1	108
Fish 2	.26	1	108
Graph	8.50	8	108
Phylum 1	26.11**	7	108
Phylum 2	18.24*	8	108

Table 20
Chi-Square Values on Grade 8 Science Assessment for Plain Language and Original Version for Special Education Students

Item	χ^2	df	n
Animal 1	.82	1	52
Animal 2	.07	1	52
Rocks	6.38	4	52
Water	6.49	5	52
Fish 1	1.08	1	52
Fish 2	.27	1	52
Graph	4.64	5	52
Phylum 1	13.61	7	52
Phylum 2	5.58	5	52

* $p < .05$
** $p < .01$

Table 21
Chi-Square Values on Grade 8 Science Assessment for Plain Language and Original Version for
LEP Students

Item	χ^2	df	n
Animal 1	#	--	6
Animal 2	#	--	6
Rocks	#	--	6
Water	3.000	2	6
Fish 1	.38	1	6
Fish 2	1.50	1	6
Graph	2.65	2	6
Phylum 1	2.63	2	6
Phylum 2	3.75	3	6

No Pearson chi-square was computed because all students received the same score on this item.

Mathematics Assessment

At the fifth grade level, these results show that there are significant differences between the performance of students who completed the original version versus the performance of students who completed the Plain Language version for four of the items. However, these differences only appear with the regular education student population. Therefore, for the LEP and the special education student population, one could conclude that there is no difference for these two populations in their performance on the two versions of the assessment. It is possible, however, that real differences do exist, but were not detected due to the smaller sample sizes available for these two populations.

In the regular education student population, four items showed significant differences between the performance of students on the two versions of the assessment. The results, however, are mixed. For example, for one of the items (Found $), those students who completed the Plain Language version were three times more likely to leave the item blank than respond to

the item while for two of the items (Shower and Car Trip) those students who completed the original version were more likely to leave the item blank than respond to the item. For the remaining item (Spinner) there was little difference in the occurrence of leaving the item blank.

Table 22
Chi-Square Values on Grade 5 Math Assessment for Plain Language and Original Version for Regular Education Students

Item	χ^2	df	n
Gilbert	6.33	6	175
Found $	12.53*	6	175
Change	6.39	4	175
Sandwich	9.35	8	175
Shower	9.59*	4	175
Trip	25.31**	8	175
Spinner	15.32*	7	175
Carpet	10.43	6	175
Rotate	1.82	3	175

Table 23
Chi-Square Values on Grade 5 Math Assessment for Plain Language and Original Version for Special Education Students

Item	χ^2	df	n
Gilbert	6.27	4	126
Found $	3.93	7	126
Change	1.34	3	126
Sandwich	8.41	6	126
Shower	1.76	3	126
Trip	6.81	7	126
Spinner	12.57	7	126
Carpet	8.81	6	126
Rotate	5.43	3	126

* $p < .05$
** $p < .01$

Table 24
Chi-Square Values on Grade 5 Math Assessment for Plain Language and Original Version for
LEP Students

Item	χ^2	df	n
Gilbert	2.52	4	29
Found $	4.60	4	29
Change	2.07	3	29
Sandwich	3.61	5	29
Shower	2.01	2	29
Trip	5.94	6	29
Spinner	8.03	4	29
Carpet	7.20	4	29
Rotate	3.07	3	29

For those students who did attempt these items, the results were also mixed. For two of the items (Found $ and Car Trip), students who completed the Plain Language version were more likely to receive a higher score on that item than students who completed the original version. For the other two items (Shower and Spinner), the reverse occurred.

At the eighth grade level, these results show that there are significant differences between the performance of students who completed the original version versus the performance of students who completed the Plain Language version for a few of the items. However, as was the case with the fifth grade students, the results are mixed.

For the regular education student population, two items (Gilligan and Tony's Walk) showed significant results. Students who completed the Plain Language version were about two times more likely to leave the Gilligan item blank as compared to those students who completed the original version. For Tony's Walk, there was little difference in the percentage of students who left the item blank. There were differences, however, in the scores obtained on this item. Students who completed the original version were much more likely to receive a high score on Tony's Walk as compared to students who completed the Plain Language version. For the other

item, Gilligan, most students received average scores regardless of the version they completed.

However, for students who completed the original version, about one-quarter received high

scores while the other quarter received low scores. On the Plain Language version, about half of

the students received low scores on this item while the other half received average scores.

For the special education student population, only one item (Quilt) showed significant

differences. Those students who completed the original version of this item were about five

times as likely to leave the item blank than those students who completed the Plain Language

version were. Of those students who did respond to the item, there was little difference

percentage of students receiving any given score.

For the LEP student population, only one item (Tony's Walk) showed significant

differences. All students in this sub-population attempted this item. Students who completed the

Plain Language version received either a high or a low score. Those students who completed the

original version received only a low score. However, as explained earlier, this analysis is based

on such a small sample, it is inappropriate to generalize to the population at large.

Table 25
Chi-Square Values on Grade 8 Math Assessment for Plain Language and Original Version for
Regular Education Students

Item	χ^2	df	n
Language	4.86	6	108
Pattern	7.94	5	108
Gilligan	30.27**	7	108
Cube 1	7.30	7	108
Cube 2	5.30	7	108
Quilt	8.33	7	108
Tony	36.22**	8	108
String	6.69	8	108
Pizza	7.94	7	108

** $p < .01$

Table 26
Chi-Square Values on Grade 8 Math Assessment for Plain Language and Original Version for Special Education Students

Item	χ^2	df	n
Language	4.35	5	52
Pattern	6.01	5	52
Gilligan	7.59	6	52
Cube 1	5.04	2	52
Cube 2	8.18	5	52
Quilt	11.81*	5	52
Tony	15.21	8	52
String	5.38	6	52
Pizza	3.60	4	52

Table 27
Chi-Square Values on Grade 8 Math Assessment for Plain Language and Original Version for LEP Students

Item	χ^2	df	n
Language	3.00	2	6
Pattern	.6	1	6
Gilligan	6.00	4	6
Cube 1	.75	2	6
Cube 2	.00	1	6
Quilt	3.00	3	6
Tony	6.00*	2	6
String	.75	2	6
Pizza	.60	1	6

* $p < .05$

SUMMARY

On average, the results of this study were mixed. With the science assessment, there was very little difference in the performance of students on the Plain Language version versus the original version except for a few items. With these few items, half of the time students who

completed the Plain Language version were more likely to leave the item blank while the other half of the time students who completed the original version were more likely to leave the item blank. When reviewing the scores received on these items, a pattern does emerge. First of all, no differences were detected with any of the multiple-choice items. Only the open-ended items exhibited significant differences. For example, for these few science items, the Plain Language version seems to differentiate among the performance of students better than original version of the item is able to do. Also, it appears that this is especially the case at the high end of the score scale. That is, for students who do not understand the science content, the version makes little if any difference. However, for those students who understand the science content presented, the Plain Language version seems to be able to more accurately assess their knowledge. This pattern appeared with both fifth and eighth grade students.

For the mathematics assessments, the results are more conflicting. As was the case with the science assessment, about half of the time students who completed the Plain Language version were more likely to leave the item blank while the other half of the time students who completed the original version were more likely to leave the item blank. When reviewing the scores received on these items, no patterns emerge. For some of the items, students who completed the Plain Language version were more likely to receive a higher score while for other items students who completed the original version were more likely to receive a higher score.

However, when reviewing both the mathematics and the science assessment, it is clear that most of the items that did exhibit significant differences were found only with the regular education student population. For the LEP and the special education student population, there appears to be little difference in their performance on the Plain Language version versus the

original version. This, however, could be due to the small sample sizes available for these two student populations in this study.

It would be useful to more fully explore using the concept of Plain Language with a larger special education and LEP student population to determine if the lack of significant differences is due to small sample sizes. Also, since these two students populations vary greatly along a number of dimensions, it would be useful to repeat this study with different subsets of a special education population such as students with learning disabilities in reading or LEP students whose native language is Spanish. These types of studies would require the cooperation of several states to acquire a large enough sample size of these sub-populations.

References

Hanson, M. R., Hayes, J. R., Schriver K., LeMahieu, P.G., & Brown, P. J. (1998, April). <u>A Plain Language Approach to the Revision of Test Items.</u> Paper presented at the annual meeting of the American Educational Research Association, San Diego, CA.

Appendix A:

Cross Tabulations of Science Items by Version
For Regular Education Student Population

Item: Food (Grade 5 Science)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	1%	0%	9%	0%	64%	1%	13%	0%	13%
Plain Language	3%	0%	11%	2%	54%	5%	11%	0%	15%

Item: Box A (Grade 5 Science)

Version	Score	
	0	1
Original	74%	26%
Plain Language	70%	31%

Item: Box C (Grade 5 Science)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	5%	0%	31%	3%	43%	4%	9%	1%	5%
Plain Language	8%	1%	28%	4%	35%	5%	17%	0%	1%

Item: Soil 1 (Grade 5 Science)

Version	Score	
	0	1
Original	40%	60%
Plain Language	37%	63%

Item: Soil 2 (Grade 5 Science)

Version	Score	
	0	1
Original	56%	43%
Plain Language	53%	47%

Item: Soil 3 (Grade 5 Science)

Version	Score					
	0	2	3	4	5	6
Original	12%	28%	5%	53%	1%	3%
Plain Language	2%	26%	3%	58%		11%

Item: Insects (Grade 5 Science)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	1%	0%	11%	0%	24%	5%	48%	1%	10%
Plain Language	2%	0%	11%	1%	18%	3%	54%	1%	11%

Item: Animal 1 (Grade 8 Science)

Version	Score	
	0	1
Original	18%	26%
Plain Language	82%	74%

Item: Animal 2 (Grade 8 Science)

Version	Score	
	0	1
Original	82%	90%
Plain Language	18%	10%

Item: Rocks (Grade 8 Science)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	22%	0%	26%	6%	36%	4%	4%	0%	2%
Plain Language	9%	2%	33%	3%	35%	3%	10%	0%	5%

Item: Water (Grade 8 Science)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	34%	2%	20%	2%	28%	4%	4%	0%	6%
Plain Language	30%	3%	30%	5%	21%	0%	7%	2%	3%

Item: Fish 1(Grade 8 Science)

Version	Score	
	0	1
Original	36%	50%
Plain Language	64%	50%

Item: Fish 2 (Grade 8 Science)

Version	Score	
	0	1
Original	57%	50%
Plain Language	43%	50%

Item: Graph (Grade 8 Science)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	12%	4%	54%	4%	12%	2%	8%	2%	2%
Plain Language	7%	0%	50%	7%	10%	2%	14%	0%	10%

Item: Phylum 1 (Grade 8 Science)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	10%	0%	12%	0%	34%	6%	16%	0%	22%
Plain Language	3%	3%	5%	22%	40%	0%	21%	0%	5%

Item: Phylum 2 (Grade 8 Science)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	10%	10%	2%	2%	18%	0%	48%	6%	4%
Plain Language	7%	0%	12%	0%	24%	3%	33%	5%	16%

Appendix B:

Cross Tabulations of Science Items by Version
For Special Education Student Population

Item: Food (Grade 5 Science)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	3%	0%	11%	3%	68%	2%	9%	0%	5%
Plain Language	18%	2%	17%	3%	48%	0%	5%	0%	7%

Item: Box A (Grade 5 Science)

Version	Score	
	0	1
Original	74%	77%
Plain Language	26%	23%

Item: Box C (Grade 5 Science)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	11%	0%	42%	6%	35%	0%	5%	0%	2%
Plain Language	22%	3%	30%	0%	33%	2%	10%	0%	0%

Item: Soil 1 (Grade 5 Science)

Version	Score						
	0	1	2	3	4	5	6
Original	26%	3%	36%	5%	29%	0%	2%
Plain Language	23%	2%	35%	0%	35%	0%	5%

Item: Soil 2 (Grade 5 Science)

Version	Score	
	0	1
Original	58%	53%
Plain Language	43%	47%

Item: Soil 3 (Grade 5 Science)

Version	Score				
	0	1	2	3	4
Original					
Plain Language					

Item: Insects (Grade 5 Science)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	3%	0%	14%	0%	44%	12%	27%	0%	0%
Plain Language	12%	2%	23%	2%	18%	8%	32%	0%	3%

Item: Animal 1 (Grade 8 Science)

Version	Score	
	0	1
Original	18%	26%
Plain Language	82%	74%

Item: Animal 2 (Grade 8 Science)

Version	Score	
	0	1
Original	82%	90%
Plain Language	18%	10%

Item: Rocks (Grade 8 Science)

Version	Score						
	0	1	2	3	4	5	6
Original	40%	4%	36%	0%	11%	0%	11%
Plain Language	25%	0%	50%	0%	25%	0%	0%

Item: Water (Grade 8 Science)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	61%	0%	14%	0%	21%	0%	4%	0%	0%
Plain Language	58%	0%	8%	4%	8%	0%	17%	0%	4%

Item: Fish 1 (Grade 8 Science)

Version	Score	
	0	1
Original	34%	37%
Plain Language	66%	64%

Item: Fish 2 (Grade 8 Science)

Version	Score	
	0	1
Original	40%	45%
Plain Language	60%	55%

Item: Graph (Grade 8 Science)

Version	Score						
	0	1	2	3	4	5	6
Original	46%	7%	36%	0%	4%	0%	7%
Plain Language	33%	4%	54%	4%	4%	0%	0%

Item: Phylum 1 (Grade 8 Science)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	29%	0%	14%	0%	36%	0%	11%	4%	7%
Plain Language	13%	0%	13%	29%	33%	4%	8%	0%	0%

Item: Phylum 2 (Grade 8 Science)

Version	Score						
	0	1	2	3	4	5	6
Original	29%	7%	29%	0%	11%	7%	18%
Plain Language	21%	4%	17%	0%	38%	8%	13%

Appendix C:

Cross Tabulations of Science Items by Version
For LEP Student Population

Item: Food (Grade 5 Science)

Version	Score					
	0	2	4	5	6	8
Original		8%	62%		23%	8%
Plain Language	6%	6%	25%	13%	31%	19%

Item: Box A (Grade 5 Science)

Version	Score	
	0	1
Original	74%	26%
Plain Language	70%	31%

Item: Box C (Grade 5 Science)

Version	Score						
	0	1	2	3	4	5	8
Original			46%	8%	39%		8%
Plain Language	13%	6%	56%		19%	6%	

Item: Soil 1 (Grade 5 Science)

Version	Score	
	0	1
Original	40%	60%
Plain Language	37%	63%

Item: Soil 2 (Grade 5 Science)

Version	Score	
	0	1
Original	58%	43%
Plain Language	53%	47%

Item: Soil 3 (Grade 5 Science)

Version	Score					
	0	2	3	4	5	6
Original	11%	28%	5%	53%	1%	3%
Plain Language	2%	26%	3%	58%		11%

Item: Insects (Grade 5 Science)

Version	Score							
	0	2	3	4	5	6	7	8
Original	1%	11%		24%	5%	48%	1%	10%
Plain Language	2%	11%	1%	18%	3%	54%	1%	11%

Item: Animal 1 (Grade 8 Science)

Version	Score	
	0	1
Original	18%	82%
Plain Language	26%	74%

Item: Animal 2 (Grade 8 Science)

Version	Score	
	0	1
Original	82%	18%
Plain Language	90%	10%

Item: Rocks (Grade 8 Science)

Version	Score		
	0	1	2
Original	0%	0%	100%
Plain Language	0%	0%	100%

Item: Water (Grade 8 Science)

Version	Score		
	0	1	2
Original	100%	0%	0%
Plain Language	25%	25%	50%

Item: Fish 1 (Grade 8 Science)

Version	Score	
	0	1
Original	34%	66%
Plain Language	36%	64%

Item: Fish 2 (Grade 8 Science)

Version	Score	
	0	1
Original	40%	60%
Plain Language	45%	55%

Item: Graph (Grade 8 Science)

Version	Score			
	0	1	2	3
Original	50%	0%	50%	0%
Plain Language	0%	0%	75%	25%

Item: Phylum 1 (Grade 8 Science)

Version	Score				
	0	1	2	3	4
Original	0%	0%	50%	0%	50%
Plain Language	0%	25%	0%	0%	75%

Item: Phylum 2 (Grade 8 Science)

Version	Score						
	0	1	2	3	4	5	6
Original	50%	0%	0%	0%	0%	0%	50%
Plain Language	0%	0%	50%	0%	25%	0%	25%

Appendix D:

Cross Tabulations of Math Items by Version
For Regular Education Student Population

Item: Gilbert (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	5%	0%	21%	1%	40%	0%	1%	0%	32%
Plain Language	7%	1%	26%	0%	46%	0%	0%	0%	20%

Item: Found $ (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	0%	0%	23%	1%	2%	1%	10%	0%	62%
Plain Language	4%	0%	17%	0%	1%	0%	2%	0%	75%

Item: Change (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	1%	0%	62%	0%	4%	0%	0%	0%	33%
Plain Language	4%	0%	45%	0%	5%	1%	0%	0%	44%

Item: Sandwich (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	2%	4%	57%	6%	18%	4%	1%	2%	5%
Plain Language	4%	0%	55%	2%	25%	1%	4%	2%	7%

Item: Shower (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	5%	0%	38%	0%	0%	1%	0%	0%	56%
Plain Language	1%	1%	58%	0%	0%	1%	0%	0%	39%

Item: Trip (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	16%	6%	55%	1%	15%	2%	2%	0%	2%
Plain Language	8%	1%	54%	0%	5%	8%	18%	2%	4%

Item: Spinner (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	11%	1%	26%	9%	28%	6%	13%	0%	6%
Plain Language	12%	1%	32%	9%	39%	0%	2%	0%	5%

Item: Carpet (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	15%	1%	50%	0%	5%	0%	1%	0%	28%
Plain Language	12%	0%	70%	1%	3%	0%	1%	0%	13%

Item: Rotate (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	5%	0%	46%	0%	0%	1%	0%	0%	48%
Plain Language	5%	0%	48%	0%	0%	4%	0%	0%	42%

Item: Language (Grade 8 Math)

Version	Score						
	0	1	2	3	4	5	8
Original	36%	11%	21%	6%	9%	2%	15%
Plain Language	46%	13%	8%	3%	12%	2%	16%

Item: Pattern (Grade 8 Math)

Version	Score					
	0	1	2	3	4	8
Original	28%	4%	40%	2%	9%	17%
Plain Language	31%	5%	26%	10%	2%	26%

Item: Gilligan (Grade 8 Math)

Version	Score							
	0	1	2	3	4	5	6	7
Original	6%	6%	6%	6%	21%	34%	17%	2%
Plain Language	12%	5%	8%	30%	38%	7%	2%	

Item: Cube 1 (Grade 8 Math)

Version	Score							
	0	1	2	3	4	5	6	8
Original	4%	2%	68%	4%	17%		2%	2%
Plain Language	8%	2%	46%	5%	26%	2%	2%	10%

Item: Cube 2 (Grade 8 Math)

Version	Score							
	0	1	2	3	4	5	6	8
Original	26%	2%	51%	4%	9%		4%	4%
Plain Language	30%	7%	48%	5%	5%	2%		5%

Item: Quilt (Grade 8 Math)

Version	Score							
	0	1	2	3	4	5	6	8
Original	9%	2%	49%	4%	13%	4%	9%	11%
Plain Language	5%	2%	33%	10%	10%	9%	25%	9%

Item: Tony (Grade 8 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	4%	4%	17%	6%	15%	11%	21%	15%	6%
Plain Language			57%	12%	21%		7%	2%	2%

Item: String (Grade 8 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	32%	6%	23%	4%	19%	2%	2%		11%
Plain Language	33%	2%	26%	2%	21%			3%	13%

Item: Pizza (Grade 8 Math)

Version	Score							
	0	1	2	3	4	5	6	8
Original	30%	9%	28%	13%	6%	2%	2%	11%
Plain Language	46%	12%	15%	5%	9%	7%	2%	7%

Appendix E:

Cross Tabulations of Math Items by Version
For Special Education Student Population

Item: Gilbert (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	19%	2%	36%	0%	27%	0%	0%	0%	17%
Plain Language	19%	0%	40%	0%	36%	0%	0%	0%	5%

Item: Found $ (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	6%	0%	42%	2%	5%	0%	3%	0%	42%
Plain Language	3%	2%	40%	2%	2%	2%	5%	0%	45%

Item: Change (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	3%	0%	73%	0%	5%	0%	0%	0%	19%
Plain Language	2%	0%	76%	0%	2%	0%	0%	0%	21%

Item: Sandwich (Grade 5 Math)

Version	Score						
	0	1	2	3	4	5	6
Original	11%	2%	66%	8%	9%	2%	3%
Plain Language	7%	2%	79%	0%	11%	2%	0%

Item: Shower (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	11%	2%	52%	0%	0%	0%	0%	0%	36%
Plain Language	13%	3%	58%	0%	0%	0%	0%	0%	26%

Item: Trip (Grade 5 Math)

Version	Score							
	0	1	2	3	4	5	6	7
Original	25%	2%	64%	0%	5%	2%	2%	2%
Plain Language	31%	0%	52%	3%	7%	5%	3%	0%

Item: Spinner (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	28%	9%	22%	9%	22%	0%	8%	0%	2%
Plain Language	18%	2%	36%	15%	27%	2%	2%	0%	0%

Item: Carpet (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	25%	2%	55%	0%	2%	0%	0%	0%	17%
Plain Language	29%	3%	47%	2%	10%	2%	0%	0%	8%

Item: Rotate (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	3%	0%	67%	0%	0%	2%	0%	0%	28%
Plain Language	15%	0%	63%	0%	0%	2%	0%	0%	21%

Item: Language (Grade 8 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	74%	7%	13%	0%	0%	0%	3%	0%	3%
Plain Language	62%	5%	19%	0%	10%	0%	0%	0%	5%

Item: Pattern (Grade 8 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	48%	3%	42%	0%	3%	0%	0%	0%	3%
Plain Language	57%	10%	19%	5%	0%	0%	0%	0%	10%

Item: Gilligan (Grade 8 Math)

Version	Score						
	0	1	2	3	4	5	6
Original	19%	3%	10%	19%	29%	16%	3%
Plain Language	19%	14%	19%	29%	5%	10%	5%

Item: Cube 1 (Grade 8 Math)

Version	Score				
	0	1	2	3	4
Original	16%	0%	81%	0%	3%
Plain Language	33%	0%	52%	0%	14%

Item: Cube 2 (Grade 8 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	45%	0%	52%	3%	0%	0%	0%	0%	0%
Plain Language	62%	5%	24%	0%	0%	0%	5%	0%	5%

Item: Quilt (Grade 8 Math)

Version	Score						
	0	1	2	3	4	5	6
Original	19%	7%	45%	0%	16%	0%	13%
Plain Language	0%	5%	57%	0%	5%	19%	14%

Item: Tony (Grade 8 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	13%	7%	39%	16%	7%	3%	7%	7%	3%
Plain Language	0%	5%	76%	0%	19%	0%	0%	0%	0%

Item: String (Grade 8 Math)

Version	Score							
	0	1	2	3	4	5	6	7
Original	42%	7%	19%	3%	26%	3%	0%	0%
Plain Language	52%	5%	29%	0%	10%	0%	0%	5%

Item: Pizza (Grade 8 Math)

Version	Score				
	0	1	2	3	4
Original	55%	23%	16%	7%	0%
Plain Language	67%	14%	14%	0%	5%

Appendix F:

Cross Tabulations of Math Items by Version
For LEP Student Population

Item: Gilbert (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	0%	0%	36%	0%	46%	0%	0%	0%	18%
Plain Language	11%	6%	33%	0%	28%	0%	0%	0%	22%

Item: Found $ (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	0%	0%	36%	0%	9%	0%	9%	0%	46%
Plain Language	11%	0%	17%	0%	0%	0%	6%	0%	67%

Item: Change (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	0%	0%	64%	0%	0%	0%	0%	0%	36%
Plain Language	11%	0%	56%	0%	6%	0%	0%	0%	28%

Item: Sandwich (Grade 5 Math)

Version	Score						
	0	1	2	3	4	5	6
Original	0%	9%	82%	0%	9%	0%	0%
Plain Language	6%	0%	78%	0%	6%	6%	6%

Item: Shower (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	9%	0%	46%	0%	0%	0%	0%	0%	46%
Plain Language	0%	0%	61%	0%	0%	0%	0%	0%	39%

Item: Trip (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	9%	18%	55%	0%	9%	9%	0%	0%	0%
Plain Language	28%	6%	44%	0%	0%	6%	11%	0%	6%

Item: Spinner (Grade 5 Math)

Version	Score						
	0	1	2	3	4	5	6
Original	18%	0%	18%	36%	18%	0%	9%
Plain Language	33%	0%	50%	6%	11%	0%	0%

Item: Carpet (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	18%	0%	36%	0%	0%	0%	9%	0%	36%
Plain Language	22%	0%	67%	6%	0%	0%	0%	0%	6%

Item: Rotate (Grade 5 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	0%	0%	55%	0%	0%	9%	0%	0%	36%
Plain Language	11%	0%	61%	0%	0%	0%	0%	0%	28%

Item: Language (Grade 8 Math)

Version	Score						
	0	1	2	3	4	5	8
Original	36%	11%	21%	6%	9%	2%	15%
Plain Language	46%	13%	8%	3%	12%	2%	16%

Item: Pattern (Grade 8 Math)

Version	Score					
	0	1	2	3	4	8
Original	28%	4%	40%	2%	9%	17%
Plain Language	31%	5%	26%	10%	2%	26%

Item: Gilligan (Grade 8 Math)

Version	Score							
	0	1	2	3	4	5	6	7
Original	6%	6%	6%	6%	21%	34%	17%	2%
Plain Language	12%	5%	8%	30%	38%	7%	2%	

Item: Cube 1 (Grade 8 Math)

Version	Score							
	0	1	2	3	4	5	6	8
Original	4%	2%	68%	4%	17%		2%	2%
Plain Language	8%	2%	46%	5%	26%	2%	2%	10%

Item: Cube 2 (Grade 8 Math)

Version	Score							
	0	1	2	3	4	5	6	8
Original	26%	2%	51%	4%	9%		4%	4%
Plain Language	30%	7%	48%	5%	5%	2%		5%

Item: Quilt (Grade 8 Math)

Version	Score						
	0	1	2	3	4	5	6
Original	19%	7%	45%	0%	16%	0%	13%
Plain Language	0%	5%	57%	0%	5%	19%	14%

Item: Tony (Grade 8 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	4%	4%	17%	6%	15%	11%	21%	15%	6%
Plain Language			57%	12%	21%		7%	2%	2%

Item: String (Grade 8 Math)

Version	Score								
	0	1	2	3	4	5	6	7	8
Original	32%	6%	23%	4%	19%	2%	2%		11%
Plain Language	33%	2%	26%	2%	21%			3%	13%

Item: Pizza (Grade 8 Math)

Version	Score							
	0	1	2	3	4	5	6	8
Original	30%	9%	28%	13%	6%	2%	2%	11%
Plain Language	46%	12%	15%	5%	9%	7%	2%	7%

Appendix G:
Math and Science Assessments