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***ADDENDUM TO THE***  
**CALIFORNIA MODIFIED ASSESSMENT**  
**TECHNICAL REPORT**  
**SPRING 2008 ADMINISTRATION**

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*The purpose of this addendum to the California Modified Assessment (CMA) Technical Report for the Spring 2008 Administration is to provide analyses for estimating the reliability of classification decisions. These analyses were completed following the adoption of the CMA performance levels for grades three through five by the State Board of Education in January 2009.*

# Decision Classification Analyses

The methodology used for estimating the reliability of classification decisions is described in Livingston and Lewis (1995) and is implemented using the Educational Testing Service (ETS)-proprietary computer program RELCLASS-COMP (Version 4.12). RELCLASS-COMP estimates decision consistency using an estimated multivariate distribution of reported classifications on the current form of the exam and classifications on a hypothetical alternate form using the reliability of the test and strong true score theory. RELCLASS-COMP also estimates decision accuracy using an estimated multivariate distribution of reported classifications on the current form of the exam and the classifications based on an all-forms average (true score). In each case, the proportion of classifications with exact agreement is the sum of the entries in the diagonal of the contingency table representing the multivariate distribution. Reliability of classification at a cut score is estimated by collapsing the multivariate distribution at the passing score boundary into an  $n$  by  $n$  table (where  $n$  is the number of performance levels) and summing the entries in the diagonal. Figure 1 and Figure 2 present the two scenarios pictorially.

**Figure 1 Decision Accuracy for Achieving a Performance Level**

		Decision made on a form actually taken	
		Does not achieve a performance level	Achieves a performance level
True status on all-forms average	Does not achieve a performance level	Correct classification	Mis-classification
	Achieves a performance level	Mis-classification	Correct classification

**Figure 2 Decision Consistency for Achieving a Performance Level**

		Decision made on the second form taken	
		Does not achieve a performance level	Achieves a performance level
Decision made on the first form taken	Does not achieve a performance level	Correct classification	Mis-classification
	Achieves a performance level	Mis-classification	Correct classification

The results of spring 2008 CMA analysis are presented in Table 1 through Table 7.

Each table includes the contingency tables for the various performance level classifications. The proportion of accurately classified students can be determined by summing across the diagonals of the upper tables; these proportions ranged from 0.62 to 0.71 across all of the CMA. The proportion of students that were classified consistently (diagonals of the lower tables) ranged from 0.51 to 0.60 across all proficiency levels for these CMA.

When the decisions are collapsed to below proficient versus proficient and above, which are the critical categories for AYP analyses, the proportion of students that were classified accurately ranged from 0.88 to 0.92 across all CMA. Similarly, the proportion of students

that are classified consistently ranged from 0.83 to 0.89 for students classified into below proficient versus proficient and advanced.

**Table 1 Reliability of Classification and Decision Accuracy: English–Language Arts, Grade Three**

	Placement Score	Advanced	Proficient	Basic	Below Basic	Far Below Basic	Category Total †
<b>Decision Accuracy</b>	40 – 48	<b>0.07</b>	0.03	0.00	0.00	0.00	0.11
	35 – 39	0.03	<b>0.09</b>	0.04	0.00	0.00	0.17
	28 – 34	0.00	0.04	<b>0.15</b>	0.05	0.00	0.24
	17 – 27	0.00	0.00	0.04	<b>0.30</b>	0.03	0.37
<b>All-forms Average*</b>	0 – 16	0.00	0.00	0.00	0.05	<b>0.07</b>	0.12
	<b>Estimated Proportion Correctly Classified : Total = 0.68, Proficient &amp; Above = 0.92</b>						
<b>Decision Consistency</b>	40 – 48	<b>0.07</b>	0.04	0.00	0.00	0.00	0.11
	35 – 39	0.04	<b>0.07</b>	0.05	0.00	0.00	0.17
	28 – 34	0.01	0.05	<b>0.12</b>	0.06	0.00	0.24
	17 – 27	0.00	0.00	0.06	<b>0.26</b>	0.05	0.37
<b>Alternate Form*</b>	0 – 16	0.00	0.00	0.00	0.06	<b>0.06</b>	0.12
	<b>Estimated Proportion Consistently Classified : Total = 0.58, Proficient &amp; Above = 0.89</b>						

\* Values in table are proportions of the total sample.

† Inconsistencies with category cell entries are due to rounding.

**Table 2 Reliability of Classification and Decision Accuracy: English–Language Arts, Grade Four**

	Placement Score	Advanced	Proficient	Basic	Below Basic	Far Below Basic	Category Total †
<b>Decision Accuracy</b>	36 – 48	<b>0.08</b>	0.03	0.00	0.00	0.00	0.11
	30 – 35	0.02	<b>0.10</b>	0.05	0.00	0.00	0.17
	24 – 29	0.00	0.03	<b>0.14</b>	0.06	0.00	0.23
	17 – 23	0.00	0.00	0.06	<b>0.23</b>	0.05	0.34
<b>All-forms Average*</b>	0 – 16	0.00	0.00	0.00	0.07	<b>0.07</b>	0.15
	<b>Estimated Proportion Correctly Classified : Total = 0.62, Proficient &amp; Above = 0.92</b>						
<b>Decision Consistency</b>	36 – 48	<b>0.07</b>	0.03	0.01	0.00	0.00	0.11
	30 – 35	0.03	<b>0.08</b>	0.05	0.01	0.00	0.17
	24 – 29	0.00	0.05	<b>0.11</b>	0.07	0.01	0.23
	17 – 23	0.00	0.01	0.07	<b>0.18</b>	0.07	0.34
<b>Alternate Form*</b>	0 – 16	0.00	0.00	0.01	0.07	<b>0.07</b>	0.15
	<b>Estimated Proportion Consistently Classified : Total = 0.51, Proficient &amp; Above = 0.87</b>						

\* Values in table are proportions of the total sample.

† Inconsistencies with category cell entries are due to rounding.

**Table 3 Reliability of Classification and Decision Accuracy: English–Language Arts, Grade Five**

	Placement Score	Advanced	Proficient	Basic	Below Basic	Far Below Basic	Category Total †
<b>Decision Accuracy</b>	38 – 48	<b>0.06</b>	0.04	0.00	0.00	0.00	0.10
	33 – 37	0.02	<b>0.10</b>	0.05	0.00	0.00	0.17
	27 – 32	0.00	0.04	<b>0.16</b>	0.06	0.00	0.26
<b>All-forms Average*</b>	17 – 26	0.00	0.00	0.06	<b>0.30</b>	0.02	0.38
	0 – 16	0.00	0.00	0.00	0.04	<b>0.04</b>	0.08
	<b>Estimated Proportion Correctly Classified : Total = 0.66, Proficient &amp; Above = 0.90</b>						
<b>Decision Consistency</b>	38 – 48	<b>0.06</b>	0.03	0.01	0.00	0.00	0.10
	33 – 37	0.03	<b>0.07</b>	0.05	0.01	0.00	0.17
	27 – 32	0.01	0.05	<b>0.12</b>	0.07	0.00	0.26
<b>Alternate Form*</b>	17 – 26	0.00	0.01	0.07	<b>0.26</b>	0.04	0.38
	0 – 16	0.00	0.00	0.00	0.04	<b>0.04</b>	0.08
	<b>Estimated Proportion Consistently Classified : Total = 0.55, Proficient &amp; Above = 0.86</b>						

\* Values in table are proportions of the total sample.

† Inconsistencies with category cell entries are due to rounding.

**Table 4 Reliability of Classification and Decision Accuracy: Mathematics, Grade Three**

	Placement Score	Advanced	Proficient	Basic	Below Basic	Far Below Basic	Category Total †
<b>Decision Accuracy</b>	42 – 48	<b>0.05</b>	0.03	0.00	0.00	0.00	0.08
	35 – 41	0.02	<b>0.17</b>	0.05	0.00	0.00	0.24
	28 – 34	0.00	0.04	<b>0.16</b>	0.05	0.00	0.24
<b>All-forms Average*</b>	17 – 27	0.00	0.00	0.04	<b>0.28</b>	0.03	0.35
	0 – 16	0.00	0.00	0.00	0.04	<b>0.05</b>	0.09
	<b>Estimated Proportion Correctly Classified : Total = 0.71, Proficient &amp; Above = 0.91</b>						
<b>Decision Consistency</b>	42 – 48	<b>0.04</b>	0.04	0.00	0.00	0.00	0.08
	35 – 41	0.04	<b>0.14</b>	0.05	0.01	0.00	0.24
	28 – 34	0.00	0.05	<b>0.13</b>	0.06	0.00	0.24
<b>Alternate Form*</b>	17 – 27	0.00	0.00	0.06	<b>0.24</b>	0.05	0.35
	0 – 16	0.00	0.00	0.00	0.04	<b>0.05</b>	0.09
	<b>Estimated Proportion Consistently Classified : Total = 0.60, Proficient &amp; Above = 0.88</b>						

\* Values in table are proportions of the total sample.

† Inconsistencies with category cell entries are due to rounding.

**Table 5 Reliability of Classification and Decision Accuracy: Mathematics, Grade Four**

	Placement Score	Advanced	Proficient	Basic	Below Basic	Far Below Basic	Category Total †
<b>Decision Accuracy</b>	37 – 48	<b>0.05</b>	0.03	0.00	0.00	0.00	0.08
	30 – 36	0.01	<b>0.15</b>	0.06	0.00	0.00	0.23
	25 – 29	0.00	0.05	<b>0.14</b>	0.07	0.00	0.25
<b>All-forms Average*</b>	17 – 24	0.00	0.00	0.07	<b>0.26</b>	0.02	0.35
	0 – 16	0.00	0.00	0.00	0.05	<b>0.04</b>	0.09
<b>Estimated Proportion Correctly Classified : Total = 0.63, Proficient &amp; Above = 0.88</b>							
<b>Decision Consistency</b>	37 – 48	<b>0.05</b>	0.03	0.00	0.00	0.00	0.08
	30 – 36	0.03	<b>0.13</b>	0.06	0.02	0.00	0.23
	25 – 29	0.00	0.06	<b>0.10</b>	0.08	0.00	0.25
<b>Alternate Form*</b>	17 – 24	0.00	0.02	0.08	<b>0.21</b>	0.05	0.35
	0 – 16	0.00	0.00	0.00	0.05	<b>0.04</b>	0.09
<b>Estimated Proportion Consistently Classified : Total = 0.52, Proficient &amp; Above = 0.84</b>							

\* Values in table are proportions of the total sample.

† Inconsistencies with category cell entries are due to rounding.

**Table 6 Reliability of Classification and Decision Accuracy: Mathematics, Grade Five**

	Placement Score	Advanced	Proficient	Basic	Below Basic	Far Below Basic	Category Total †
<b>Decision Accuracy</b>	39 – 48	<b>0.06</b>	0.03	0.00	0.00	0.00	0.09
	32 – 38	0.02	<b>0.15</b>	0.06	0.00	0.00	0.22
	26 – 31	0.00	0.04	<b>0.15</b>	0.06	0.00	0.25
<b>All-forms Average*</b>	17 – 25	0.00	0.00	0.06	<b>0.28</b>	0.02	0.37
	0 – 16	0.00	0.00	0.00	0.05	<b>0.03</b>	0.08
<b>Estimated Proportion Correctly Classified : Total = 0.67, Proficient &amp; Above = 0.90</b>							
<b>Decision Consistency</b>	39 – 48	<b>0.06</b>	0.03	0.00	0.00	0.00	0.09
	32 – 38	0.03	<b>0.12</b>	0.06	0.01	0.00	0.22
	26 – 31	0.00	0.06	<b>0.12</b>	0.07	0.00	0.25
<b>Alternate Form*</b>	17 – 25	0.00	0.01	0.08	<b>0.23</b>	0.05	0.37
	0 – 16	0.00	0.00	0.00	0.05	<b>0.03</b>	0.08
<b>Estimated Proportion Consistently Classified : Total = 0.56, Proficient &amp; Above = 0.86</b>							

\* Values in table are proportions of the total sample.

† Inconsistencies with category cell entries are due to rounding.

**Table 7 Reliability of Classification and Decision Accuracy: Science, Grade Five**

	Placement Score	Advanced	Proficient	Basic	Below Basic	Far Below Basic	Category Total †
<b>Decision Accuracy</b>	38 – 48	<b>0.07</b>	0.05	0.00	0.00	0.00	0.11
	32 – 37	0.03	<b>0.16</b>	0.06	0.00	0.00	0.25
	25 – 31	0.00	0.05	<b>0.21</b>	0.05	0.00	0.32
	17 – 24	0.00	0.00	0.06	<b>0.18</b>	0.01	0.26
	0 – 16	0.00	0.00	0.00	0.04	<b>0.03</b>	0.06
<b>Estimated Proportion Correctly Classified : Total = 0.65, Proficient &amp; Above = 0.88</b>							
<b>Decision Consistency</b>	38 – 48	<b>0.06</b>	0.04	0.00	0.00	0.00	0.11
	32 – 37	0.05	<b>0.13</b>	0.07	0.01	0.00	0.25
	25 – 31	0.01	0.07	<b>0.17</b>	0.07	0.00	0.32
	17 – 24	0.00	0.01	0.07	<b>0.15</b>	0.03	0.26
	0 – 16	0.00	0.00	0.00	0.03	<b>0.03</b>	0.06
<b>Estimated Proportion Consistently Classified : Total = 0.53, Proficient &amp; Above = 0.83</b>							
<b>All-forms Average*</b>							

\* Values in table are proportions of the total sample.

† Inconsistencies with category cell entries are due to rounding.

## References

Livingston, S. A., and Lewis, C. “Estimating the Consistency and Accuracy of Classification Based on Test Scores,” *Journal on Educational Measurement*, Vol. 32, pp. 179–197, 1995.