



## **ISAT Comparability Investigations**

**Phase 1:**

### **Accommodated Forms of the 2009 ISAT**

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## **Executive Summary**

Historical ISAT data indicate that the ELL students and those with disabilities who took special (S) forms or linguistically modified forms (L) tend to have lower performances than general student population taking the standard Form (1). If comparing *p*-value across forms, discrepancies could be caused by ability differences rather than item functioning. In order to avoid the confounding effect of ability and item functioning, differential item function analysis is used for this investigation based on the 2009 ISAT. These analyses took two forms. First, students' scores on new (i.e., current pilot) items were compared across Forms 1, L, and S. Some discrepancies were found on the same item between forms; however, there is no clear pattern across forms, grades, or subjects. This finding supports the assumption that neither of the forms is systematically different from the others, while simultaneously providing valuable information for the selection of test items for the 2010 test. Secondly, and most importantly, the impact of using Form 1 vs. Form L on the raw-to-scale-score transformations is minimal across areas and grades, especially near the "does not meet" vs. "meets" boundaries. Thus, the net effect of using linguistically modified forms on student accountability is essentially nil, thereby supporting the equivalence and meaningfulness of scores on the linguistically modified ISAT forms.

# **Form Equivalence Investigation through Differential Item Functioning**

## **Background**

The 2009 Illinois Standards Assessment Test (ISAT) administration is different from the 2008 in two ways: 1) a linguistically modified (L) form is added to the existing accommodations, and 2) a different cover page is used for accommodations of large print, reader script, and auditory via audiocassette or compact disk (CD) that were not formally distinguished in administration. All accommodations that used such a cover are called special form (S).

The L form and S form are adapted from form 1. During the adaption process, state and Pearson content experts reviewed individual items to ensure that necessary modification is implemented and item construct are not changed. This procedure leads to the assumption that items appearing on the three forms are equivalent, and thus, could be equated as one form.

The purpose of this investigation is to confirm that items of forms 1 and L form performed similarly. The S form is included in this study for reference purposes, but too few cases are available to perform all analyses. Historical data indicate that the ELL students and those who took L and S forms tended to have lower performances than general student population. If comparing  $p$ -value across forms, discrepancies could be caused by ability differences rather than item functioning. In order to avoid the confounding effect of ability and item functioning, differential item function analysis is used for this investigation.

## **Method**

Differential item function (DIF) methods are applied to detect whether an item exhibits different statistical characteristics for different subgroups. DIF statistic removes ability impacts by controlling ability when comparing the probabilities of getting correct answer across subgroups. This investigation focuses on pilot items. Detailed procedure is described as follows:

- 1) In order to obtain item parameter estimates for each form, pilot items of the three forms are treated as different items. Census items are treated as common items among the three forms. Figure 1 presents the data structure for equating.

Census items	Form 1 pilot items	Form L pilot items	Form S pilot items

Figure 1: Data Structure

- 2) Use concurrent equating design to equate forms 1, L, and S.

- a) This step estimates the probabilities of answering an item correctly along the theta scale for forms 1, L, and S pilot items in one equating procedure.
  - b) Reading and mathematics is equated using the three-parameter logistic model.
  - c) Science is equated using the Rasch model.
- 3) Compute  $d^2$ :
- a) The same items on forms 1, L, and S are paired and the probability differences of paired items are computed along theta scale. This study uses  $d^2$  procedure: the difference of weighted sum of the squared deviation between the ICCs at each theta point. The equation is as follows:

$$d_i^2 = \sum_{k=1}^k [P_{ix}(\theta_k) - P_{iy}(\theta_k)]^2 \cdot g(\theta_k),$$

where  $P_{ix}(\theta_k)$ -  $P_{iy}(\theta_k)$  is the difference of the probability of correctly answering the given item of the two forms. The  $g(\theta_k)$  is the weight of theta distribution. The same 40 theta values and their weights used in the ISAT reading and mathematics  $d^2$  procedure is used in this procedure.

- b) Flag items with large  $d^2$ . In last year's ISAT equating, an empirical  $d^2$  value of 0.01877 was found to define the threshold for "large". The same value is used to flag items for this study.

Note that reading has only forms 1 and S; thus, its DIF investigation only addressed forms 1 and S. The pilot short-response and extended-response items are not scored, and are thus excluded from this study. This results in five mathematics, five science, and 20 reading pilot items per grade. This analysis is replicated for quality control purpose.

## Results

The number of DIF analysis that shows large  $d^2$  values is summarized by subject and grade (see Table 1). Since DIF analysis is a paired-comparison procedure, having two forms with 20 items each for reading, and three forms with five items each for mathematics and science, the total number of DIF analysis for each reading grade is 20 and 15 for the other two subjects.

The number of flagged items in Table 1 maintains relatively stable for reading, except grade 7. Mathematics DIF flag count fluctuates and science has five flags in both grades. The results do not indicate patterns across grades or subjects. In other words, DIF is not caused by systematic effects that are associated with subject or grade. Noteworthy is the higher Grade 7 DIF counts across subjects, which suggests another item review might be necessary for this grade.

Further investigation of large  $d^2$  values across forms, again, reveals no definite pattern across grades or subjects (see Table 2). When comparing across paired-comparisons, more DIF flags show on the L vs. S comparisons of mathematics grades 3, 4, 7, and 8, yet grades 5 and 6 have zero flags. While forms 1 vs. L comparisons have less flags comparing to other comparisons of different forms, grade 7 has the

largest counts among all comparisons. Science flags, on the other hand, distribute relatively even across form comparisons. Note that reading has only forms 1 and S comparisons and the results are given in Table 1; thus, it is not repeated in Table 2.

Table 1: Number of Items Exhibit large  $d^2$  by Subject and Grade

	Number of DIF Analysis per Grade	Grade					
		3	4	5	6	7	8
Reading	20	3	2	3	3	7	4
Mathematics	15	4	3	1	1	5	3
Science	15	--	5	--	--	5	--

Note. Large  $d^2$  refers to values  $> 0.01877$ .

Table 2: Number of Items Exhibit large  $d^2$  by Forms

	Forms	Grade					
		3	4	5	6	7	8
Mathematics	Form 1 vs. L	1	0	0	0	3	1
	Form 1 vs. S	1	1	1	1	0	0
	L vs. S	2	2	0	0	2	2
Science	Form 1 vs. L	--	1	--	--	2	--
	Form 1 vs. S	--	2	--	--	2	--
	L vs. S	--	2	--	--	1	--

DIF analysis is accomplished at item level. However, the impact of individual item on the whole test sometimes is negligible, especially when the test is long. In order to evaluate the impact of individual items on a group of items, the cumulated characteristic curves, rather than item characteristic curves, are presented. Since reading items are passage-based, the characteristic curves are cumulated at passage level. Reading has two passage curves per grade and each passage curve is a composite of ten items (see Figures 2 through 13). Mathematics and science are reported at the form level, with one curve for each grade (see Figures 14 through 21).

Reading passage curves have forms 1 and S. Most of the passages have overlapping curves at some theta range. In some instances, the two lines follow each other closely along long theta range then depart at the high ability range. There is no clear pattern of which form is easier across passages. Mathematics and science have three curves per chart: forms 1, L, and S. The mathematics and science curves are closer than reading in general. Again, there is no clear pattern of which form is easier or harder than the others.

In summary, this study shows that some larger discrepancies are found on the same item between forms; however, there is no clear pattern across forms, grades, or subjects. The large discrepancies appear on all possible form comparisons (i.e., Form 1 vs. L, Form 1 vs. S, and L vs. S) rather than specific paired forms. This finding reveals that neither of the forms is systematically different from the others. The DIF is a random item-by-item situation.

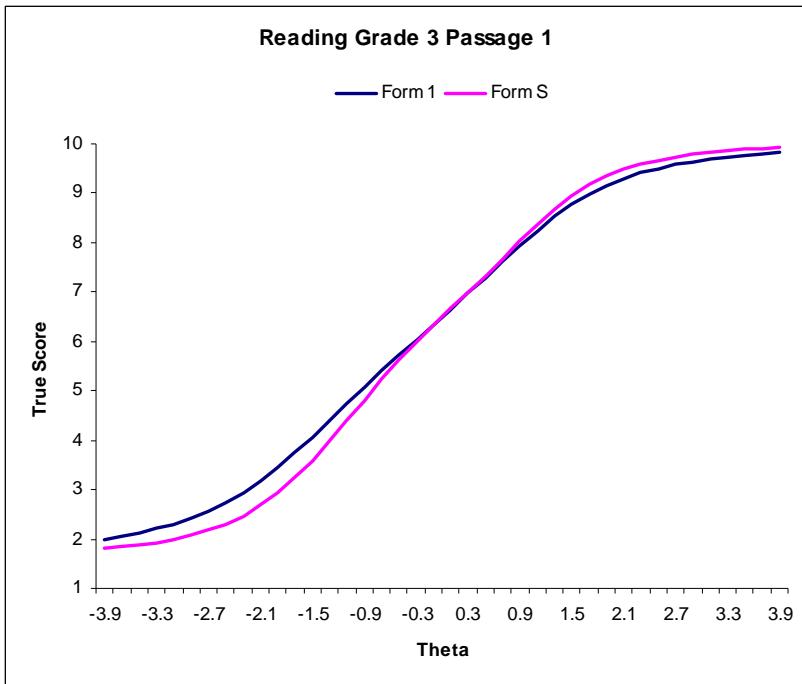


Figure 2: Reading Grade 3 Passage 1 Curve

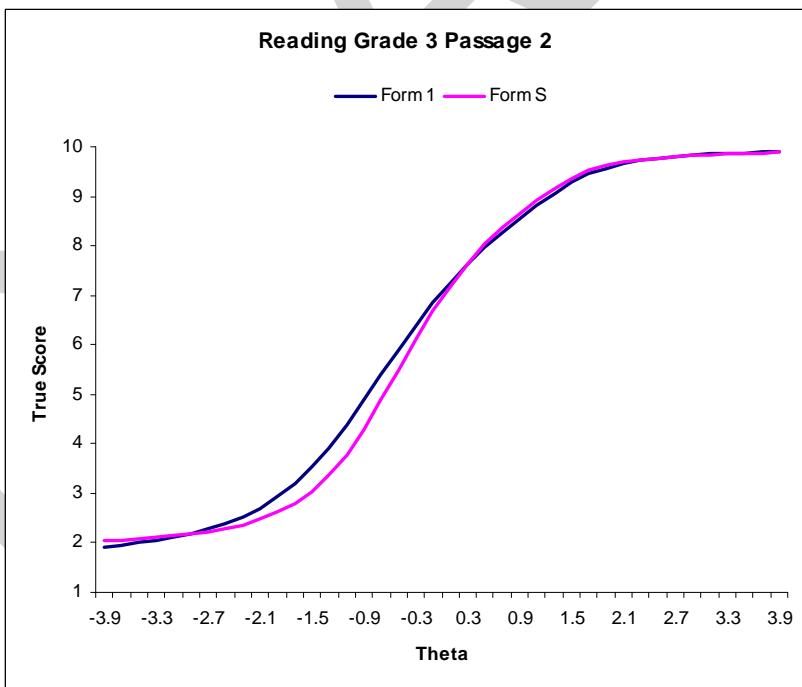


Figure 3: Reading Grade 3 Passage 2 Curve

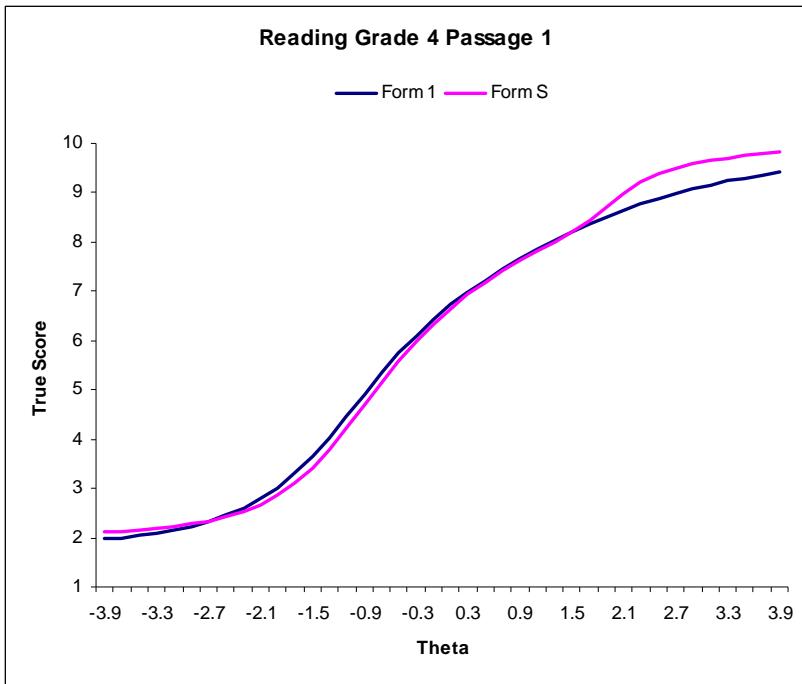


Figure 4: Reading Grade 4 Passage 1 Curve

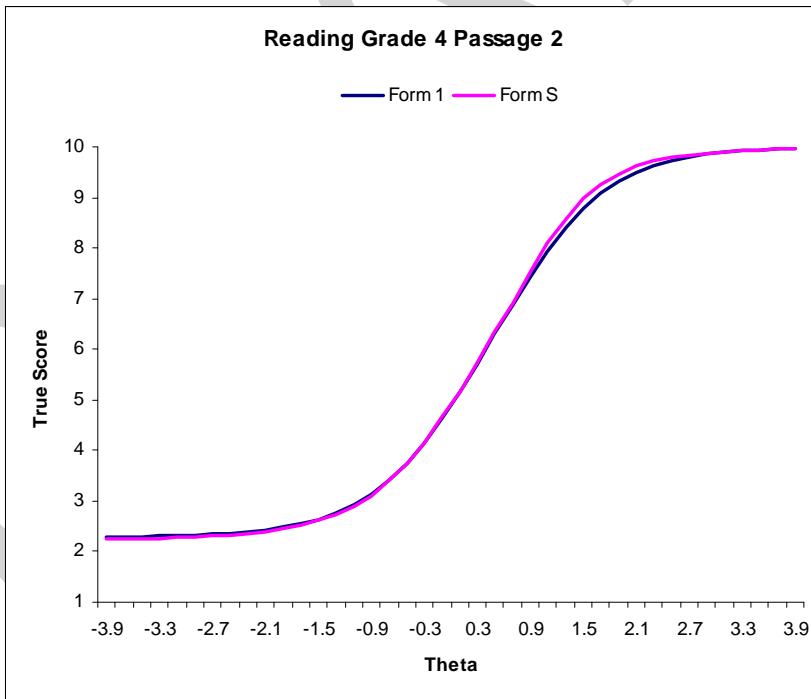


Figure 5: Reading Grade 4 Passage 2 Curve

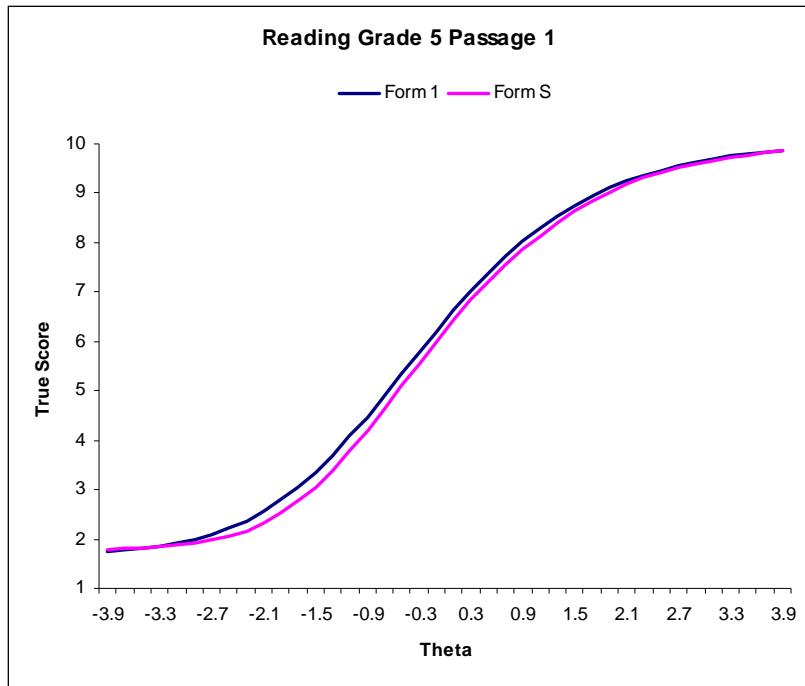


Figure 6: Reading Grade 5 Passage 1 Curve

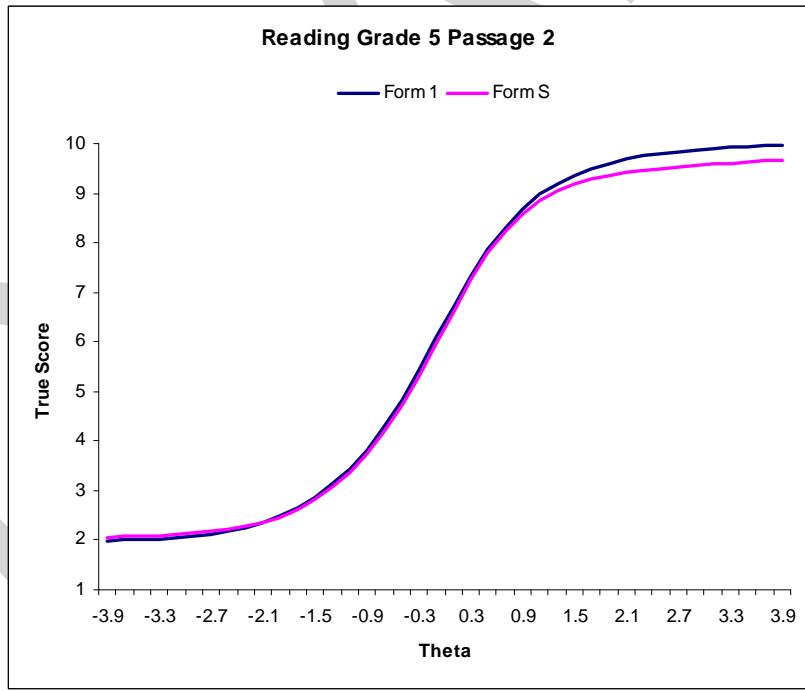


Figure 7: Reading Grade 5 Passage 2 Curve

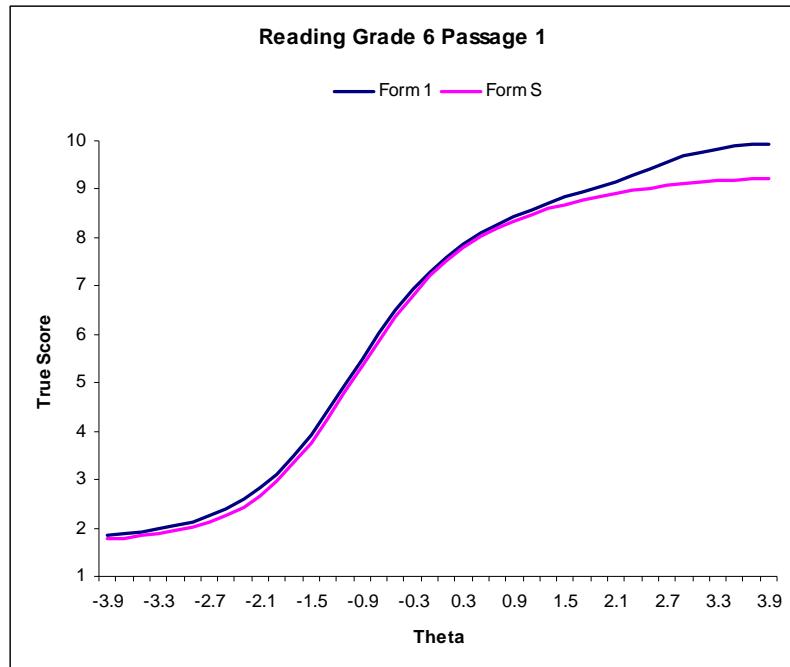


Figure 8: Reading Grade 6 Passage 1 Curve

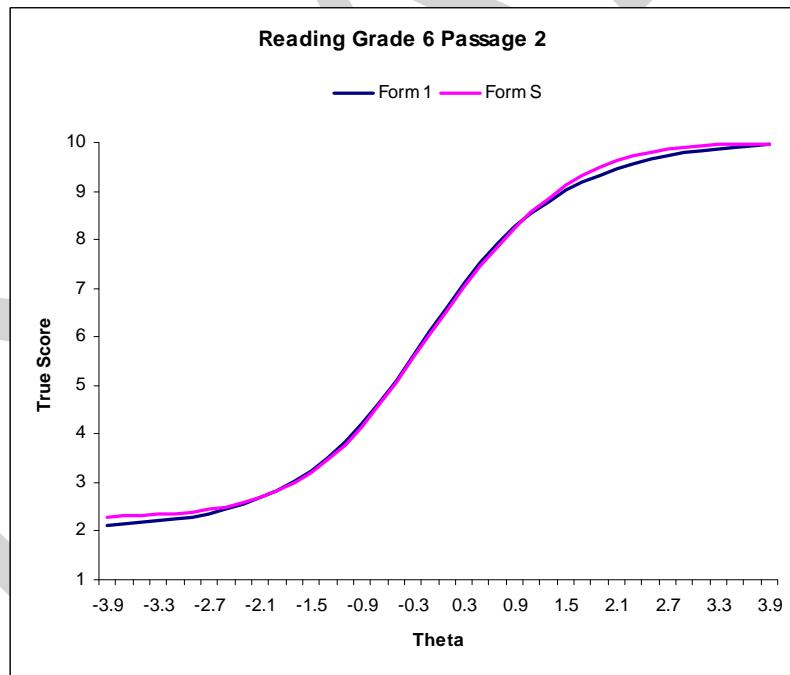


Figure 9: Reading Grade 6 Passage 2 Curve

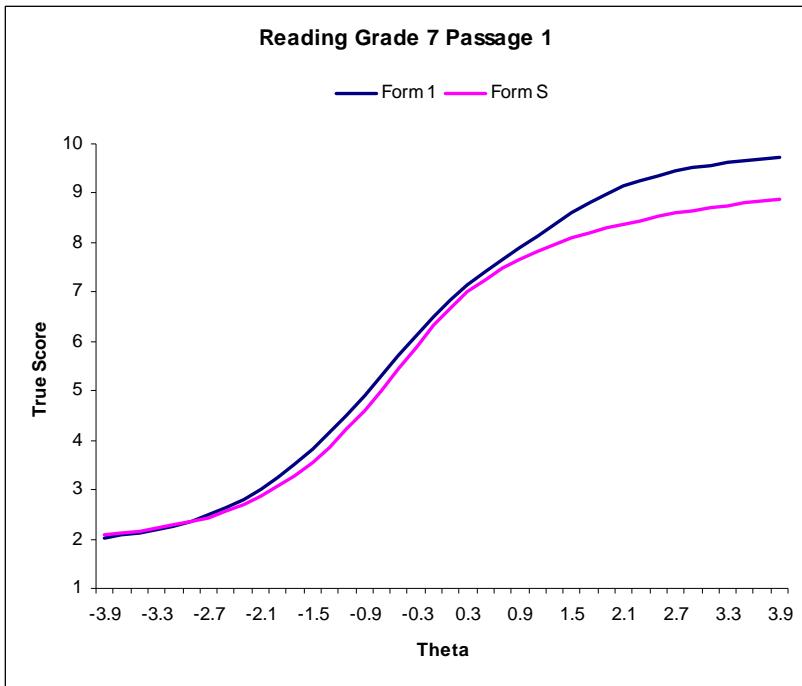


Figure10: Reading Grade 7 Passage 1 Curve

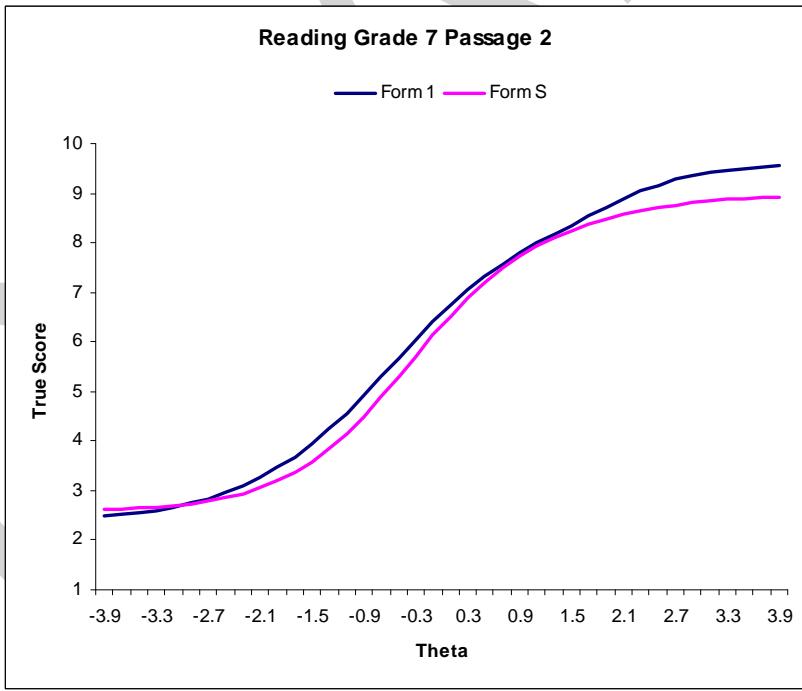


Figure 11: Reading Grade 7 Passage 2 Curve

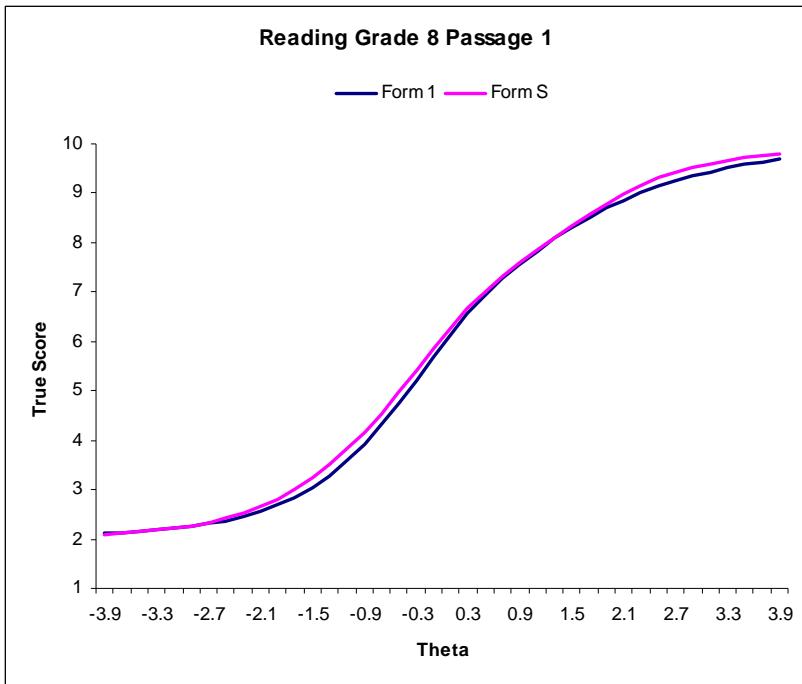


Figure 12: Reading Grade 8 Passage 1 Curve

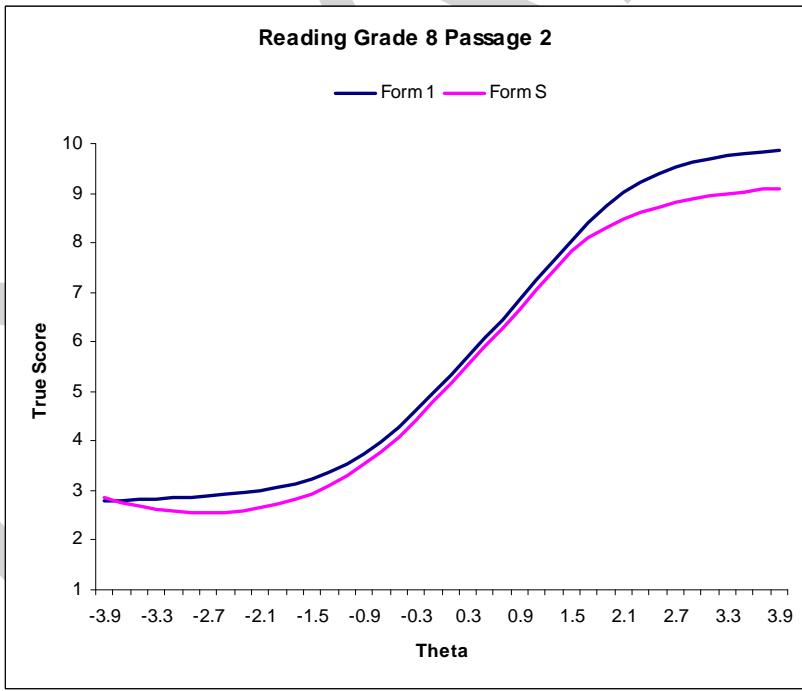


Figure 13: Reading Grade 8 Passage 2 Curve

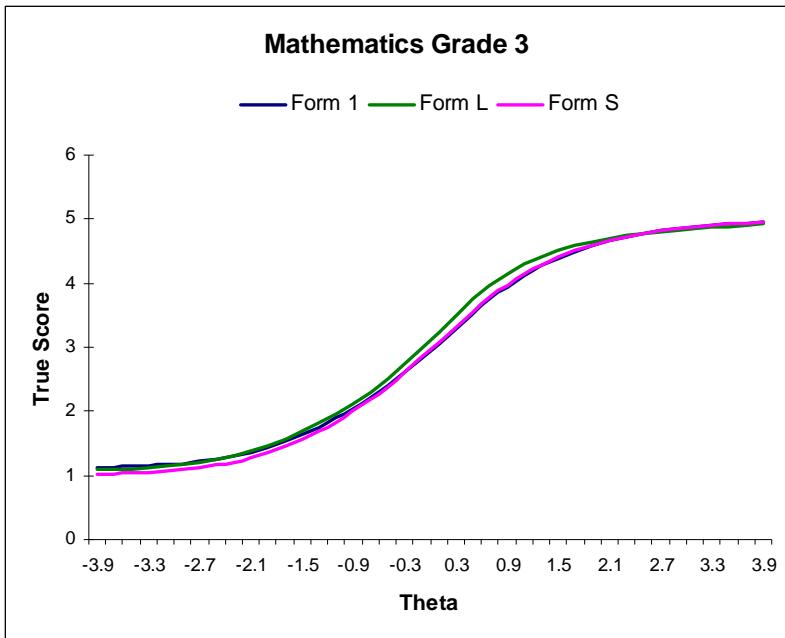


Figure 14: Mathematics Grade 3 Form Curve

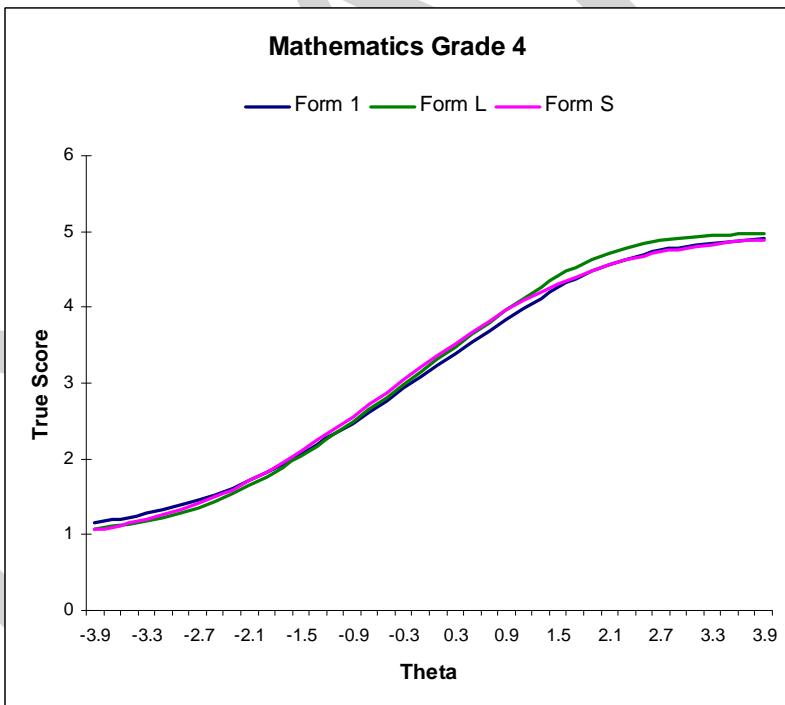


Figure 15: Mathematics Grade 4 Form Curve

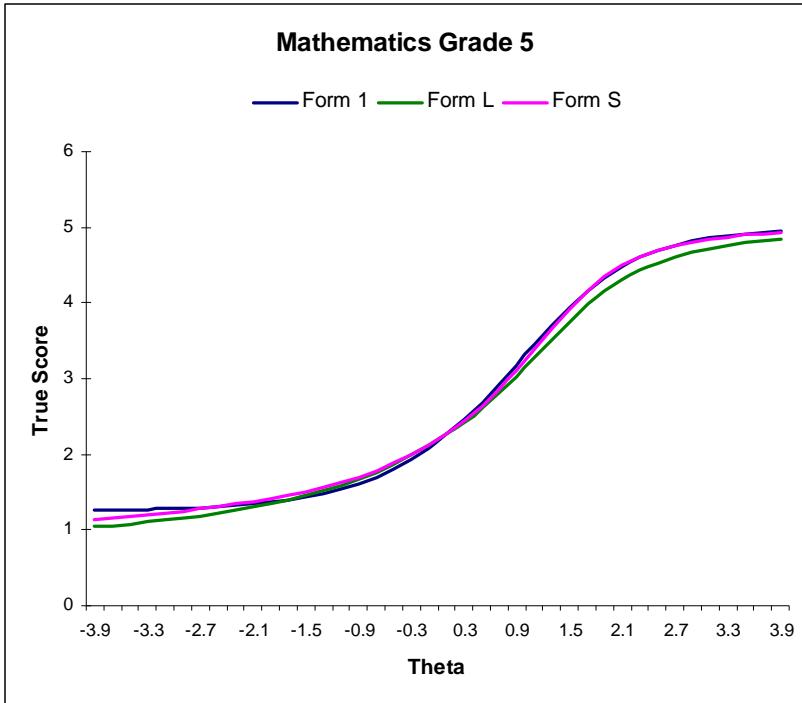


Figure 16: Mathematics Grade 5 Form Curve

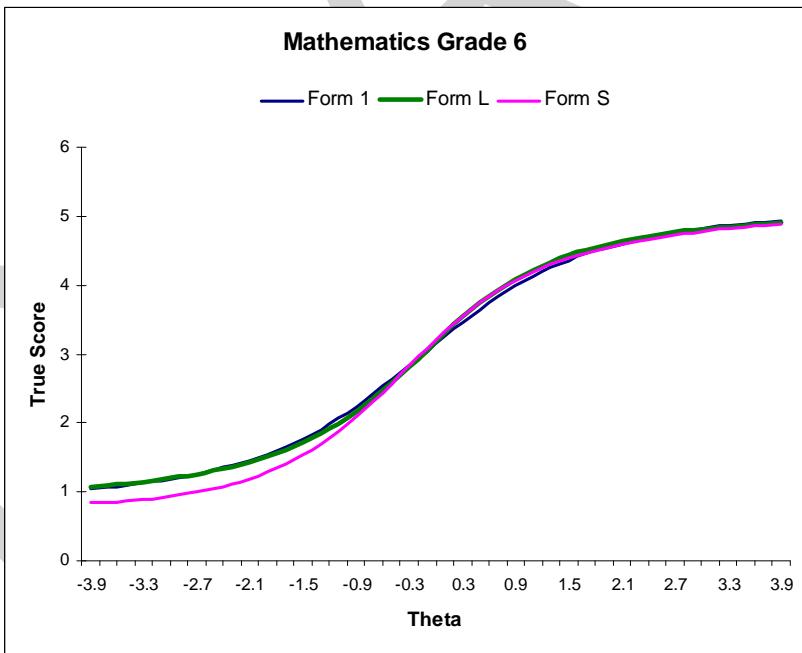


Figure 17: Mathematics Grade 6 Form Curve

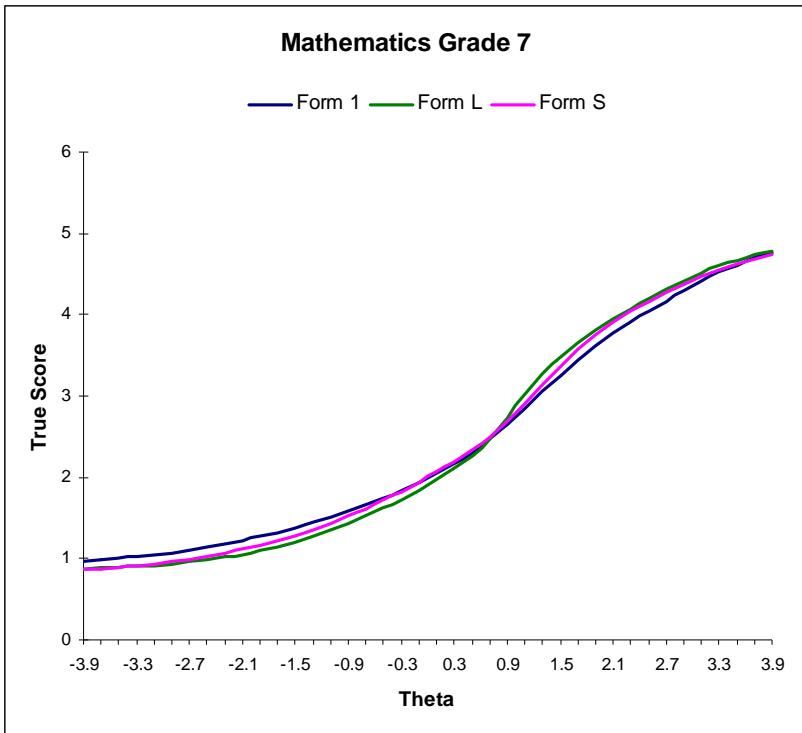


Figure 18: Mathematics Grade 7 Form Curve

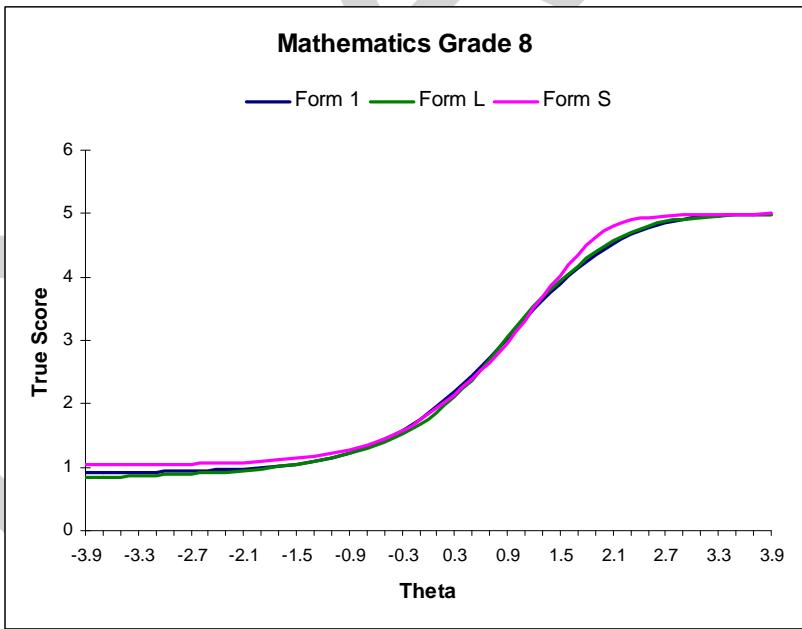


Figure 19: Mathematics Grade 8 Form Curve

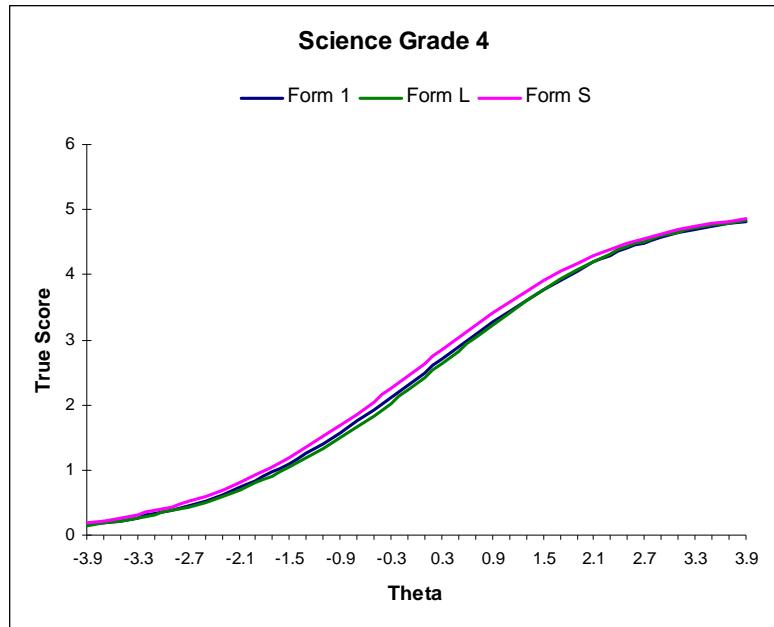


Figure 20: Science Grade 4 Form Curve

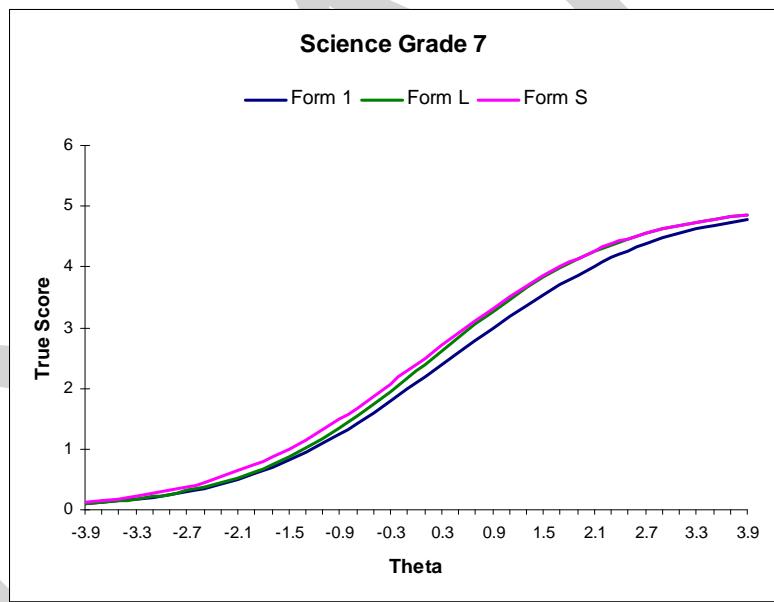


Figure 21: Science Grade 7 Form Curve

## **Form Equivalence Investigation through Raw Score-to-Scale Score Tables**

In 2007, the ISAT population did not include ELL students because the ELL students took the IMAGE test. However, the IMAGE test was cancelled in 2008 and the ELL students took the regular ISAT mathematics and science instead. In 2009, the linguistically modified forms were developed in mathematics and science areas for the ELL students. Due to the assumption that items appearing on the linguistically modified forms and ISAT form 1 are equivalent, the 2009 ISAT raw score-to scale score conversion tables were generated including the linguistically modified test takers.

An equating was conducted using only linguistically modified records to investigate its equivalence of Form 1 and Form L with the 2009 ISAT scale scores. The results are presented in the following tables. Along with the 2009 ISAT scale scores and linguistically modified scale scores are 2007 and 2008 scale scores. The trend would provide a better picture of the ISAT scale scores. Scale scores that are highlighted in yellow or blue are the performance cut scores. The results show that linguistically modified scale scores are close to the 2009 ISAT, especially at the cuts of below-meet and meet-exceed.

Please note that the Form S could not be studied in this way due to the rather small number of students taking this form.

### Grade 3 Mathematics

<b>Subject</b>	<b>Grade</b>	<b>Raw Score</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>LM</b>
M	03	0	120	120	120	120
M	03	1	120	120	120	120
M	03	2	120	120	120	120
M	03	3	120	120	120	120
M	03	4	120	120	120	120
M	03	5	120	120	120	120
M	03	6	120	120	120	120
M	03	7	120	120	120	120
M	03	8	120	120	120	120
M	03	9	120	124	123	120
M	03	10	124	128	127	124
M	03	11	128	133	131	127
M	03	12	131	137	135	131
M	03	13	134	140	139	136
M	03	14	137	142	142	140
M	03	15	139	145	145	143
M	03	16	142	147	148	146
M	03	17	144	150	150	149
M	03	18	146	152	153	152
M	03	19	149	154	155	154
M	03	20	151	156	158	157
M	03	21	153	159	160	159
M	03	22	155	161	163	161
M	03	23	157	163	164	163
M	03	24	159	164	166	165
M	03	25	161	166	168	167
M	03	26	163	168	170	170
M	03	27	164	170	172	171
M	03	28	166	172	174	173
M	03	29	168	173	176	175
M	03	30	170	175	177	177
M	03	31	171	177	179	179
M	03	32	173	179	181	180
M	03	33	175	180	182	182
M	03	34	177	182	184	184
M	03	35	178	184	186	185
M	03	36	180	185	187	187
M	03	37	181	187	189	189
M	03	38	184	189	190	190
M	03	39	185	190	192	192
M	03	40	186	192	194	193
M	03	41	188	193	195	195
M	03	42	189	195	197	196
M	03	43	191	197	198	198
M	03	44	193	198	200	199
M	03	45	194	200	201	201
M	03	46	196	202	203	203

M	03	47	198	203	204	204
M	03	48	199	205	206	206
M	03	49	201	207	208	207
M	03	50	203	208	209	209
M	03	51	204	210	211	210
M	03	52	206	212	213	212
M	03	53	208	214	214	214
M	03	54	210	216	216	215
M	03	55	212	218	218	217
M	03	56	214	219	220	219
M	03	57	216	221	221	220
M	03	58	218	224	224	222
M	03	59	220	225	225	224
M	03	60	222	228	227	226
M	03	61	224	230	230	228
M	03	62	227	232	232	230
M	03	63	230	235	234	232
M	03	64	233	237	237	235
M	03	65	236	240	239	237
M	03	66	239	243	242	240
M	03	67	242	246	245	243
M	03	68	246	249	248	246
M	03	69	250	253	252	249
M	03	70	255	257	256	253
M	03	71	260	262	261	258
M	03	72	267	268	267	263
M	03	73	274	275	274	270
M	03	74	285	285	283	279
M	03	75	300	299	297	293
M	03	76	341	341	341	341

### Grade 4 Mathematics

<b>Subject</b>	<b>Grade</b>	<b>Raw Score</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>LM</b>
M	04	0	120	120	120	120
M	04	1	120	120	120	120
M	04	2	120	120	120	120
M	04	3	120	120	120	120
M	04	4	120	123	120	120
M	04	5	124	130	127	123
M	04	6	130	135	132	129
M	04	7	134	140	137	133
M	04	8	139	144	141	137
M	04	9	142	148	145	141
M	04	10	146	151	149	145
M	04	11	149	154	152	148
M	04	12	152	156	155	150
M	04	13	155	159	157	153
M	04	14	157	162	160	156
M	04	15	160	164	163	158
M	04	16	162	167	166	161
M	04	17	164	169	169	165
M	04	18	166	172	172	168
M	04	19	168	174	174	170
M	04	20	170	176	176	172
M	04	21	172	177	178	176
M	04	22	174	179	180	178
M	04	23	176	181	182	180
M	04	24	178	183	184	182
M	04	25	179	185	186	184
M	04	26	181	187	188	186
M	04	27	183	189	189	188
M	04	28	184	190	191	190
M	04	29	186	192	193	192
M	04	30	188	194	194	194
M	04	31	189	195	196	196
M	04	32	191	197	197	197
M	04	33	193	198	200	199
M	04	34	194	200	201	200
M	04	35	196	202	202	202
M	04	36	197	203	204	203
M	04	37	199	205	205	205
M	04	38	200	206	207	206
M	04	39	202	208	208	208
M	04	40	204	209	210	209
M	04	41	205	211	211	211
M	04	42	206	213	213	212
M	04	43	208	214	214	214
M	04	44	210	216	216	215
M	04	45	211	218	218	217
M	04	46	213	219	219	219
M	04	47	214	221	221	220

M	04	48	216	223	222	222
M	04	49	218	225	224	223
M	04	50	219	226	226	225
M	04	51	221	228	228	227
M	04	52	223	230	229	229
M	04	53	225	232	231	230
M	04	54	227	234	233	232
M	04	55	228	236	235	234
M	04	56	230	238	237	236
M	04	57	232	240	239	238
M	04	58	234	243	241	240
M	04	59	237	245	244	243
M	04	60	239	247	247	245
M	04	61	241	250	248	247
M	04	62	244	252	251	249
M	04	63	247	255	254	252
M	04	64	249	258	257	255
M	04	65	252	261	260	257
M	04	66	255	264	263	260
M	04	67	258	267	266	263
M	04	68	262	271	270	267
M	04	69	266	275	274	271
M	04	70	270	280	279	275
M	04	71	276	285	284	281
M	04	72	282	291	291	288
M	04	73	289	299	300	297
M	04	74	299	309	316	313
M	04	75	314	331	355	355
M	04	76	355	355		

### Grade 5 Mathematics

<b>Subject</b>	<b>Grade</b>	<b>Raw Score</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>LM</b>
M	05	0	120	120	120	120
M	05	1	120	120	120	120
M	05	2	120	120	120	120
M	05	3	126	127	128	123
M	05	4	134	135	137	132
M	05	5	141	142	143	138
M	05	6	146	147	149	144
M	05	7	151	152	154	149
M	05	8	155	156	158	153
M	05	9	159	160	162	156
M	05	10	162	163	165	160
M	05	11	165	167	168	163
M	05	12	168	170	171	166
M	05	13	171	173	174	168
M	05	14	174	176	176	171
M	05	15	176	179	180	173
M	05	16	178	180	181	175
M	05	17	180	184	183	178
M	05	18	183	186	186	180
M	05	19	185	188	187	183
M	05	20	187	190	190	185
M	05	21	189	192	192	188
M	05	22	191	193	193	190
M	05	23	193	195	195	193
M	05	24	194	197	197	195
M	05	25	196	198	199	197
M	05	26	198	200	201	199
M	05	27	200	202	203	201
M	05	28	201	203	204	204
M	05	29	203	205	206	206
M	05	30	204	206	208	208
M	05	31	206	208	210	210
M	05	32	207	209	212	212
M	05	33	209	211	214	214
M	05	34	211	212	215	215
M	05	35	212	214	217	217
M	05	36	214	215	218	219
M	05	37	215	217	220	221
M	05	38	217	218	222	223
M	05	39	218	220	224	225
M	05	40	220	221	225	226
M	05	41	222	223	227	228
M	05	42	223	224	229	230
M	05	43	225	226	230	231
M	05	44	226	227	232	233
M	05	45	228	229	234	235
M	05	46	229	230	236	237
M	05	47	231	232	238	238

M	05	48	233	234	240	240
M	05	49	234	235	241	242
M	05	50	236	237	243	244
M	05	51	237	239	245	245
M	05	52	239	241	247	247
M	05	53	241	243	249	249
M	05	54	243	244	251	251
M	05	55	245	246	253	253
M	05	56	246	249	255	255
M	05	57	249	250	257	257
M	05	58	250	253	259	259
M	05	59	252	255	262	261
M	05	60	255	257	264	263
M	05	61	257	259	267	266
M	05	62	259	262	269	268
M	05	63	262	265	271	271
M	05	64	264	267	274	273
M	05	65	267	271	277	276
M	05	66	271	273	281	279
M	05	67	273	276	284	282
M	05	68	277	280	288	286
M	05	69	281	284	292	291
M	05	70	285	288	297	296
M	05	71	290	293	302	302
M	05	72	296	298	310	311
M	05	73	303	305	319	322
M	05	74	313	315	337	345
M	05	75	328	329	369	369
M	05	76	369	369		

### Grade 6 Mathematics

<b>Subject</b>	<b>Grade</b>	<b>Raw Score</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>LM</b>
M	06	0	120	120	120	120
M	06	1	120	120	120	120
M	06	2	130	133	130	127
M	06	3	141	144	142	139
M	06	4	149	153	150	147
M	06	5	156	159	157	154
M	06	6	161	165	162	160
M	06	7	166	169	167	164
M	06	8	170	174	171	168
M	06	9	174	177	175	172
M	06	10	177	181	178	175
M	06	11	180	184	182	179
M	06	12	183	186	184	181
M	06	13	186	188	187	184
M	06	14	188	190	189	186
M	06	15	191	193	191	188
M	06	16	194	194	193	189
M	06	17	195	197	194	191
M	06	18	197	199	196	194
M	06	19	199	201	198	195
M	06	20	201	203	200	197
M	06	21	203	204	202	199
M	06	22	205	206	204	201
M	06	23	206	208	206	204
M	06	24	208	209	207	206
M	06	25	210	211	209	208
M	06	26	212	213	211	209
M	06	27	213	214	213	211
M	06	28	215	216	214	213
M	06	29	217	217	216	215
M	06	30	218	219	218	217
M	06	31	219	220	219	219
M	06	32	221	222	221	220
M	06	33	223	223	222	222
M	06	34	225	225	224	225
M	06	35	226	226	225	226
M	06	36	227	227	227	227
M	06	37	228	229	229	229
M	06	38	230	230	230	230
M	06	39	231	232	232	232
M	06	40	233	233	233	234
M	06	41	234	234	235	235
M	06	42	236	236	236	237
M	06	43	237	237	238	239
M	06	44	239	239	240	240
M	06	45	240	240	241	242
M	06	46	241	242	243	243
M	06	47	243	243	244	245

M	06	48	244	245	246	247
M	06	49	246	246	248	248
M	06	50	248	248	249	250
M	06	51	249	250	251	252
M	06	52	251	251	253	253
M	06	53	252	253	255	255
M	06	54	254	254	256	257
M	06	55	256	256	258	259
M	06	56	258	258	260	261
M	06	57	259	259	262	262
M	06	58	261	261	264	264
M	06	59	263	263	266	266
M	06	60	265	265	268	269
M	06	61	267	267	270	271
M	06	62	270	270	273	273
M	06	63	272	272	276	276
M	06	64	275	274	278	278
M	06	65	276	276	280	281
M	06	66	280	280	283	284
M	06	67	283	283	286	287
M	06	68	287	286	290	291
M	06	69	291	290	294	294
M	06	70	295	294	298	299
M	06	71	300	299	303	304
M	06	72	306	305	309	310
M	06	73	313	312	317	318
M	06	74	323	322	328	328
M	06	75	338	338	347	348
M	06	76	379	379	379	379

### Grade 7 Mathematics

<b>Subject</b>	<b>Grade</b>	<b>Raw Score</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>LM</b>
M	07	0	120	120	120	120
M	07	1	120	120	120	120
M	07	2	136	135	135	129
M	07	3	148	147	147	142
M	07	4	157	156	156	151
M	07	5	164	162	163	158
M	07	6	170	168	169	163
M	07	7	175	173	173	168
M	07	8	179	177	178	173
M	07	9	183	181	182	176
M	07	10	186	185	185	180
M	07	11	190	188	188	183
M	07	12	193	191	192	186
M	07	13	196	195	195	189
M	07	14	198	197	197	191
M	07	15	201	199	200	194
M	07	16	203	202	202	197
M	07	17	205	204	205	199
M	07	18	207	207	207	202
M	07	19	210	208	209	205
M	07	20	212	211	211	207
M	07	21	214	213	213	210
M	07	22	216	215	215	212
M	07	23	218	217	217	215
M	07	24	219	219	219	217
M	07	25	221	221	221	219
M	07	26	223	223	223	222
M	07	27	225	225	225	224
M	07	28	226	226	227	226
M	07	29	228	228	229	228
M	07	30	230	230	231	230
M	07	31	231	232	232	232
M	07	32	233	233	235	235
M	07	33	235	235	236	236
M	07	34	236	237	238	238
M	07	35	238	238	239	240
M	07	36	239	240	241	242
M	07	37	241	241	243	244
M	07	38	242	243	245	245
M	07	39	244	245	246	247
M	07	40	245	246	248	249
M	07	41	247	248	250	251
M	07	42	248	250	251	253
M	07	43	250	251	253	254
M	07	44	251	253	255	256
M	07	45	253	254	256	258
M	07	46	254	256	258	259
M	07	47	256	258	260	261

M	07	48	257	259	262	263
M	07	49	259	261	263	264
M	07	50	261	263	265	266
M	07	51	263	265	267	268
M	07	52	264	267	269	270
M	07	53	266	268	271	271
M	07	54	268	270	272	273
M	07	55	269	272	274	275
M	07	56	271	274	276	277
M	07	57	273	276	278	279
M	07	58	275	278	281	281
M	07	59	277	281	282	283
M	07	60	279	282	285	285
M	07	61	281	285	287	287
M	07	62	283	287	289	289
M	07	63	286	290	292	292
M	07	64	288	292	294	294
M	07	65	291	295	297	297
M	07	66	294	298	300	301
M	07	67	297	302	303	304
M	07	68	300	306	307	308
M	07	69	304	310	311	312
M	07	70	309	315	316	317
M	07	71	314	320	322	323
M	07	72	319	328	329	331
M	07	73	327	337	339	341
M	07	74	337	353	356	358
M	07	75	352	392	392	392
M		76	392			

### Grade 8 Mathematics

<b>Subject</b>	<b>Grade</b>	<b>Raw Score</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>LM</b>
M	08	0	120	120	120	120
M	08	1	136	134	135	132
M	08	2	156	152	154	151
M	08	3	167	164	166	163
M	08	4	176	173	175	172
M	08	5	182	180	181	178
M	08	6	188	185	187	184
M	08	7	193	190	192	189
M	08	8	197	194	196	193
M	08	9	201	198	200	197
M	08	10	204	201	203	200
M	08	11	207	204	206	203
M	08	12	210	207	209	206
M	08	13	213	210	212	209
M	08	14	216	213	215	211
M	08	15	218	215	218	214
M	08	16	221	217	221	216
M	08	17	223	221	222	218
M	08	18	225	223	225	220
M	08	19	227	225	227	221
M	08	20	229	228	229	224
M	08	21	231	230	231	227
M	08	22	233	232	233	229
M	08	23	235	234	235	232
M	08	24	236	236	236	234
M	08	25	238	238	238	236
M	08	26	240	240	240	238
M	08	27	242	242	242	240
M	08	28	243	243	243	242
M	08	29	245	245	245	244
M	08	30	246	246	246	246
M	08	31	248	248	248	247
M	08	32	250	249	249	249
M	08	33	251	251	251	251
M	08	34	253	252	252	253
M	08	35	254	254	254	254
M	08	36	256	255	255	256
M	08	37	257	257	257	257
M	08	38	259	258	258	259
M	08	39	260	260	259	261
M	08	40	262	261	261	262
M	08	41	263	262	262	264
M	08	42	265	264	264	265
M	08	43	266	265	265	267
M	08	44	268	267	267	268
M	08	45	269	268	268	269
M	08	46	271	270	269	271
M	08	47	272	271	271	272

M	08	48	274	273	273	274
M	08	49	276	274	274	275
M	08	50	277	276	276	277
M	08	51	279	277	277	278
M	08	52	280	279	279	279
M	08	53	282	280	280	281
M	08	54	284	282	282	282
M	08	55	286	284	283	284
M	08	56	288	285	285	285
M	08	57	289	288	287	287
M	08	58	291	289	288	288
M	08	59	293	291	290	290
M	08	60	295	293	292	292
M	08	61	298	295	294	293
M	08	62	300	297	296	295
M	08	63	303	299	298	297
M	08	64	305	302	301	299
M	08	65	308	304	303	301
M	08	66	311	307	306	304
M	08	67	314	310	309	306
M	08	68	318	313	312	309
M	08	69	321	317	316	312
M	08	70	326	321	320	316
M	08	71	331	327	324	321
M	08	72	337	333	331	327
M	08	73	344	341	339	335
M	08	74	354	353	350	346
M	08	75	369	371	370	365
M	08	76	410	410	410	410

### Grade 4 Science

<b>Subject</b>	<b>Grade</b>	<b>Raw Score</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>LM</b>
S	04	0	120	120	120	120
S	04	1	120	120	120	120
S	04	2	120	120	120	120
S	04	3	120	120	120	120
S	04	4	120	120	120	120
S	04	5	120	120	120	120
S	04	6	120	120	120	120
S	04	7	120	120	120	120
S	04	8	120	120	120	120
S	04	9	120	122	120	120
S	04	10	123	126	124	124
S	04	11	127	129	127	128
S	04	12	130	133	131	131
S	04	13	134	136	134	134
S	04	14	137	139	137	137
S	04	15	140	142	140	140
S	04	16	142	145	143	143
S	04	17	145	147	145	146
S	04	18	147	150	148	148
S	04	19	150	152	151	151
S	04	20	152	155	153	153
S	04	21	154	157	155	155
S	04	22	156	159	158	158
S	04	23	158	161	160	160
S	04	24	160	163	162	162
S	04	25	163	165	164	164
S	04	26	165	167	166	166
S	04	27	166	169	168	168
S	04	28	169	171	170	170
S	04	29	170	173	172	172
S	04	30	172	175	174	174
S	04	31	174	177	176	176
S	04	32	176	179	178	178
S	04	33	178	181	180	180
S	04	34	179	182	181	181
S	04	35	181	184	183	183
S	04	36	183	186	185	185
S	04	37	185	188	187	187
S	04	38	187	190	189	189
S	04	39	189	191	191	191
S	04	40	190	193	193	193
S	04	41	192	195	194	194
S	04	42	194	197	196	196
S	04	43	196	199	198	198
S	04	44	198	200	200	200
S	04	45	199	202	202	202
S	04	46	202	204	204	204
S	04	47	203	206	206	206

S	04	48	205	208	208	208
S	04	49	207	210	210	210
S	04	50	209	212	212	212
S	04	51	211	214	214	214
S	04	52	213	216	216	216
S	04	53	215	218	218	218
S	04	54	218	220	220	220
S	04	55	220	223	223	223
S	04	56	222	225	225	225
S	04	57	224	227	227	227
S	04	58	227	230	230	230
S	04	59	229	232	232	232
S	04	60	232	235	235	235
S	04	61	234	238	237	237
S	04	62	237	241	241	241
S	04	63	241	244	244	244
S	04	64	244	247	247	247
S	04	65	247	251	251	251
S	04	66	251	255	255	254
S	04	67	255	259	259	259
S	04	68	260	263	263	263
S	04	69	265	269	269	269
S	04	70	271	275	275	275
S	04	71	279	282	282	282
S	04	72	288	292	292	292
S	04	73	301	305	305	304
S	04	74	323	326	326	326
S	04	75	359	363	363	363

### Grade 7 Science

<b>Subject</b>	<b>Grade</b>	<b>Raw Score</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>LM</b>
S	07	0	120	120	120	120
S	07	1	120	120	120	120
S	07	2	120	120	120	120
S	07	3	120	120	120	120
S	07	4	123	125	121	123
S	07	5	130	132	129	131
S	07	6	136	138	135	137
S	07	7	141	144	140	142
S	07	8	146	148	145	147
S	07	9	151	153	149	152
S	07	10	154	157	153	155
S	07	11	158	160	157	159
S	07	12	161	164	160	162
S	07	13	164	167	163	165
S	07	14	167	170	166	168
S	07	15	170	173	169	171
S	07	16	173	175	172	174
S	07	17	175	178	174	177
S	07	18	177	180	177	179
S	07	19	180	183	179	181
S	07	20	182	185	181	184
S	07	21	184	187	184	186
S	07	22	187	189	186	188
S	07	23	189	191	188	191
S	07	24	191	194	190	193
S	07	25	193	196	192	194
S	07	26	195	198	194	197
S	07	27	197	200	197	199
S	07	28	199	202	198	200
S	07	29	200	204	200	202
S	07	30	202	205	202	204
S	07	31	204	207	204	206
S	07	32	206	209	206	208
S	07	33	208	211	208	210
S	07	34	210	213	210	212
S	07	35	211	215	211	214
S	07	36	214	217	214	215
S	07	37	215	218	215	217
S	07	38	217	220	217	219
S	07	39	219	222	219	221
S	07	40	220	224	220	223
S	07	41	222	226	222	224
S	07	42	224	227	224	226
S	07	43	226	229	226	228
S	07	44	228	231	228	230
S	07	45	229	233	230	232
S	07	46	231	235	232	234
S	07	47	233	237	233	236

S	07	48	235	239	236	237
S	07	49	237	241	237	240
S	07	50	239	243	240	241
S	07	51	241	245	242	243
S	07	52	243	247	243	246
S	07	53	245	249	246	248
S	07	54	247	251	248	250
S	07	55	249	253	250	252
S	07	56	252	256	253	254
S	07	57	254	258	255	256
S	07	58	256	260	257	260
S	07	59	260	263	260	262
S	07	60	262	266	262	264
S	07	61	264	268	265	267
S	07	62	267	271	268	270
S	07	63	270	274	271	273
S	07	64	274	278	275	276
S	07	65	277	281	278	280
S	07	66	281	285	282	284
S	07	67	285	289	286	288
S	07	68	290	294	291	292
S	07	69	295	299	296	298
S	07	70	301	305	302	304
S	07	71	309	313	310	311
S	07	72	318	322	319	321
S	07	73	331	335	332	333
S	07	74	352	357	354	355
S	07	75	389	393	390	392

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