6.1 Rationale for the Use of the Rasch Model

In addition to reporting raw score summary statistics and item level statistics using classical test theory (CTT), the items on the Mod-MSA: Mathematics test were also analyzed within the framework of item response theory (IRT). The Rasch model (Rasch, 1960) for dichotomous items was used for developing, scoring, and reporting the Mod-MSA: Mathematics assessment. This model was recommended for several reasons.

First, the sample size requirements for calibration, scaling, and equating under the Rasch model are significantly smaller than for other IRT models. For example, the Rasch model requires about 400 examinees per form for equating versus approximately 1,500 examinees per form under the 3PL IRT model (Kolen and Brennan, 2004, p. 288). This requirement for the Rasch model was particularly useful since the n-counts for the Mod-MSA: Mathematics were expected to be low.

Second, for the requirements of the Mod-MSA: Mathematics examination, the Rasch model has one characteristic that makes it very useful. There exists a one-to-one relationship between raw scores and scale scores. That is, a student who answers a certain number of items correctly will receive the same scale score as a second student with the same raw score, regardless of which particular items within the test form were answered correctly.

6.2 Fit Statistics for the Rasch Model

Fit statistics are used for evaluating the goodness-of-fit of a model to the data. They are calculated by comparing the observed and expected trace lines obtained for an item after parameter estimates are obtained using a particular model. WINSTEPS provides two kinds of fit statistics called mean-squares that show the size of the randomness or amount of distortion of the measurement system.

The outfit and infit statistics are used in order to ascertain the suitability of the data for constructing variables and making measures with the Rasch model. These fit statistics are mean square standardized residuals for item by person responses averaged over persons and partitioned between proficiency groups (outfit) and within proficiency groups (infit). When the observed item characteristic curve (ICC) departs from the expected ICC from a reference value of 1, there is an expectation of high proficiency students failing on an easy item or low proficiency students succeeding on a difficult one. The outfit mean square evaluates the agreement between the observed ICC and the best fitting Rasch model curve over the proficiency sub-groups. It is a standardized outlier-sensitive mean square fit statistic, more sensitive to unexpected behavior by persons on items far from the person's proficiency level. The infit, on the other hand, is a within-group mean square, which summarizes the degree of misfit remaining within proficiency groups after the between-group misfit has been removed from the total. The infit, therefore, is a standardized information-weighted mean square statistic, which is more sensitive to unexpected responses to items near the person's proficiency level.

Outfit mean-squares are influenced by outliers and are usually easy to diagnose and remedy. Infit mean-squares, on the other hand, are influenced by response patterns and are harder to diagnose and remedy. In general, mean-squares near 1.0 indicate little distortion of the measurement system, while values less than 1.0 indicate that observations are too predictable (redundancy,

model overfit). Values greater than 1.0 indicate unpredictability (unmodeled noise, model underfit).

Generally speaking, when item fit indices are lower then 0.5, they do not discriminate well and show greater than expected degree of consistency. Similarly, a fit value higher than 1.5 indicates inconsistency in examinee scores on the item, i.e., some unexpectedly high scores are obtained by low proficiency candidates, and low scores for high proficiency candidates. Linacre and Wright (1999) provide an overall guideline for evaluating mean-square fit statistics (see Table 6.2.1, below).

Table 6.2.1. Criteria to Evaluate Mean-Square Fit Statistics

Mean-Square (MSQ)	Interpretation
> 2.0	Distorts or degrades the measurement system
1.5 – 2.0	Unproductive for construction of measurement, but not degrading
0.5 – 1.5	Productive for measurement
< 0.5	Unproductive for measurement, but not degrading. May produce misleadingly good reliabilities and separations

Note: Adapted from Linacre & Wright, 1999.

In our analysis, items were flagged if they distorted measurements, degraded the measurement system, or were unproductive for measurement, i.e., if the MSQ > 2.0 logits or MSQ < 0.5 logits.

6.3 Rasch Item Level Statistics

Table 6.3.1 to Table 6.3.6 provides IRT-based item parameters and includes:

- UIN
- Item sequence number
- Item strand number
- N-Count
- Rasch difficulty estimate
- Standard error of the Rasch difficulty (SE)
- Mean-square infit
- Mean-square outfit

Table 6.3.1. The 2010 Mod-MSA Mathematics IRT Item Parameters: Grade 3

Item UIN	Item Seq. No.	Item Strand No.	n- Count	Rasch Difficulty	SE	MS Infit	MS Outfit
100000197601	1	246	669	-1.3233	0.0954	0.95	0.94
100000197604	2	246	669	0.0165	0.0816	0.96	0.97
100000098438	3	241	669	0.2773	0.0823	1.07	1.09
100000098445	4	241	669	-0.3712	0.0825	0.93	0.96
100000098439	5	241	669	-0.2097	0.0818	0.94	0.92
100000098516	6	268	669	-0.3238	0.0822	0.90	0.88
100000185401	7	273	669	0.6825	0.0855	1.03	1.07
100000185403	8	273	669	0.5604	0.0842	1.09	1.10
100000197723	9	257	669	-0.1630	0.0817	1.03	1.02
100000197745	10	257	669	-0.2901	0.0821	0.92	0.90
100000197780	11	262	669	0.1898	0.0819	1.08	1.12
100000197781	12	262	669	-0.1031	0.0816	0.98	0.95
100000098529	13	268	669	0.5533	0.0842	1.11	1.14
100000197752	14	257	669	0.4000	0.0830	0.99	1.00
100000197753	15	273	669	0.8929	0.0881	1.00	1.03
100000197754	16	273	669	1.1103	0.0916	1.13	1.20
100000197620	17	246	669	-0.9309	0.0880	1.01	1.08
100000197647	18	246	669	-0.1896	0.0818	0.99	0.98
100000098440	19	241	669	-0.8020	0.0863	1.00	0.99
100000098448	20	241	669	-0.5641	0.0838	0.92	0.89
100000185375	21	268	669	-0.4600	0.0830	0.96	0.95
100000185389	22	273	669	0.2167	0.0820	1.08	1.09
100000185391	23	273	669	0.3725	0.0828	0.96	0.95
100000197617	24	246	669	0.6535	0.0852	1.12	1.15
100000197603	25	246	669	-0.7356	0.0855	1.04	1.07
100000197677	26	257	669	0.4069	0.0830	1.12	1.14
100000197751	27	257	669	1.1527	0.0924	1.03	1.12
100000197722	28	257	669	0.3520	0.0827	1.06	1.07
100000350878	29	241	669	-0.2498	0.0819	1.01	1.00
100000098450	30	241	669	-0.3103	0.0822	0.97	0.94
100000197651	31	246	669	-1.1318	0.0914	1.06	1.18
100000197655	32	273	669	1.4240	0.0982	1.11	1.17
100000197656	33	273	669	-0.9621	0.0885	0.95	0.91
100000197741	34	257	669	0.0963	0.0817	0.93	0.91
100000197755	35	257	669	-0.0898	0.0816	1.01	1.00
100000197779	36	262	669	-0.5153	0.0834	0.90	0.86
100000197670	37	251	669	-0.1563	0.0817	0.99	0.98

Table 6.3.1. The 2010 Mod-MSA Mathematics IRT Item Parameters: Grade 3 (Continued)

Item UIN	Item Seq. No.	Item Strand No	n- Count	Rasch Difficulty	SE	MS Infit	MS Outfit
100000197674	38	251	669	-0.0898	0.0816	0.96	0.96
100000197675	39	273	669	0.2100	0.0820	0.98	0.99
100000098452	40	273	669	-0.9309	0.0880	0.89	0.83
100000098444	41	241	669	0.6680	0.0853	1.06	1.07
100000197667	42	241	669	0.5960	0.0846	1.03	1.04
100000197668	43	251	669	0.1965	0.0820	1.01	1.00
100000197669	44	273	669	0.7786	0.0866	1.03	1.04
100000098451	45	273	669	-0.5501	0.0837	0.88	0.85
100000098454	46	241	669	-0.8469	0.0868	0.94	0.92
100000098447	47	241	669	1.0116	0.0899	1.11	1.18
100000185378	48	241	669	-0.8620	0.0871	0.92	0.88
100000197757	49	268	669	-0.3103	0.0822	0.87	0.85
100000197761	50	257	669	-0.3916	0.0826	0.96	0.96
100000197765	51	273	669	-0.0632	0.0816	1.10	1.12
100000098449	52	273	669	-0.5641	0.0838	0.89	0.85
100000098453	53	241	669	0.5251	0.0839	1.08	1.10
100000197602	54	241	669	-0.0632	0.0816	1.09	1.11
100000197621	55	246	669	-0.4876	0.0832	0.97	0.97
100000197660	56	246	669	-0.9621	0.0885	0.92	0.87
100000197756	57	246	669	-0.6348	0.0844	0.96	1.03
100000098446	58	257	669	0.7786	0.0866	1.04	1.06
100000098455	59	241	669	0.6607	0.0852	1.15	1.18
100000197648	60	241	669	1.0523	0.0906	1.14	1.21
100000197649	61	246	669	-0.7284	0.0854	0.94	0.92
100000197650	62	273	669	0.4970	0.0837	1.13	1.14
100000185382	63	273	669	0.3725	0.0828	1.04	1.06
100000185313	64	268	669	-1.1910	0.0925	0.91	0.83
100000197662	65	268	669	0.0630	0.0816	0.90	0.89
100000197665	66	251	669	-0.4463	0.0829	0.95	0.93
100000098522	67	251	669	-0.9001	0.0876	0.89	0.82
100000185484	68	268	669	0.4691	0.0835	1.04	1.05
100000185404	69	273	669	0.3316	0.0826	1.01	1.01
100000197746	70	273	669	0.9084	0.0884	1.17	1.22
100000197724	71	257	669	0.0231	0.0816	0.93	0.90
100000197750	72	257	669	0.5604	0.0842	1.08	1.11
100000098527	73	257	669	0.9162	0.0885	1.06	1.10
100000185381	74	268	669	-0.5153	0.0834	0.93	0.91
100000098435	75	268	669	-0.0964	0.0816	0.97	0.94

Table 6.3.1. The 2010 Mod-MSA Mathematics IRT Item Parameters: Grade 3 (Continued)

Item UIN	Item Seq. No [1]	Item Strand No	n- Count	Rasch Difficulty	SE	MS Infit	MS Outfit
100000185485	76	241	669	0.0763	0.0817	0.93	0.91
100000185486	77	273	669	-0.5641	0.0838	0.91	0.86
100000185380	78	273	669	0.1030	0.0817	1.01	1.00
100000185384	79	268	669	-0.5711	0.0838	0.93	0.91
100000185377	80	268	669	-0.1230	0.0816	0.96	0.94
100000197720	81	268	669	0.2841	0.0823	0.99	0.99
100000185386	82	257	669	0.5040	0.0838	1.03	1.04
100000185477	83	268	669	-0.7797	0.0860	0.97	0.90
100000185473	84	273	669	0.8011	0.0869	0.96	0.96
100000197676	85	273	669	0.6318	0.0849	1.12	1.15
100000197664	86	251	669	0.5251	0.0839	1.00	1.01
100000098532	87	251	669	0.9398	0.0888	1.11	1.19
100000185387	88	268	669	0.3520	0.0827	0.93	0.92
100000185376	89	268	669	0.1831	0.0819	1.05	1.08
100000197740	90	268	669	-0.5222	0.0834	0.92	0.90
100000197661	91	257	669	-0.3036	0.0821	1.00	0.99
100000098515	92	251	669	-0.1230	0.0816	0.86	0.84
100000185385	93	268	669	1.1612	0.0926	1.10	1.14
100000197663	94	268	669	0.3452	0.0827	1.05	1.05
100000197666	95	251	669	-0.2364	0.0819	0.98	0.97
100000098441	96	251	669	-0.0765	0.0816	1.17	1.21
100000185388	97	241	669	-0.3036	0.0821	0.98	1.02
100000185390	98	273	669	-0.4738	0.0831	0.90	0.87
100000185379	99	273	669	-0.4738	0.0831	0.99	0.98
100000185383	100	268	669	-0.8169	0.0865	0.85	0.78

Note: 1. 241= Algebra, 246=Geometry, 251=Measurement, 257=Statistics, 262= Probability, 268=Numbers and Computation, and 373&374= Process
2. These analyses are based on the equating sample used with the exclusion criterion.

Table 6.3.2. The 2010 Mod-MSA Mathematics IRT Item Parameters: Grade 4

Item UIN	Item Seq. No.	Item Strand No	n-Count	Rasch Difficulty	SE	MS Infit	MS Outfit
100000198111	1	251	872	-0.0382	0.0711	0.94	0.94
100000198113	2	273	872	-0.2475	0.0716	0.97	0.96
100000198114	3	273	872	-0.2269	0.0715	1.06	1.10
100000198138	4	257	872	0.7870	0.0752	0.98	0.99
100000198123	5	257	872	-0.2629	0.0716	0.98	0.99
100000098578	6	241	872	0.4073	0.0722	0.93	0.96
100000186564	7	268	872	0.4177	0.0722	1.06	1.09
100000186565	8	273	872	0.8849	0.0764	1.06	1.09
100000186566	9	273	872	0.8327	0.0757	1.17	1.22
100000098583	10	241	872	0.6531	0.0739	1.06	1.07
100000098584	11	241	872	-1.3010	0.0838	0.90	0.81
100000198124	12	257	872	-0.2732	0.0717	0.99	0.98
100000198153	13	262	872	0.5394	0.0730	1.10	1.12
100000198098	14	246	872	-1.1913	0.0817	0.94	0.97
100000198100	15	246	872	0.1141	0.0712	1.06	1.07
100000198133	16	257	872	0.5394	0.0730	1.02	1.03
100000198134	17	273	872	0.1090	0.0712	0.98	0.97
100000198135	18	273	872	0.6812	0.0742	1.23	1.30
100000198110	19	251	872	-1.1847	0.0816	0.94	0.91
100000098579	20	241	872	-0.9080	0.0772	0.96	0.94
100000098581	21	241	872	0.3708	0.0720	0.97	0.96
100000198140	22	262	872	-0.5900	0.0737	0.94	0.93
100000198142	23	273	872	-0.0891	0.0712	1.05	1.05
100000198143	24	273	872	-0.0129	0.0711	1.02	1.01
100000198126	25	257	872	0.9559	0.0773	1.15	1.24
100000198128	26	257	872	0.2315	0.0714	1.07	1.07
100000198092	27	246	872	0.1396	0.0712	1.10	1.12
100000198099	28	246	872	-0.2939	0.0718	1.09	1.11
100000198117	29	251	872	0.2417	0.0715	0.93	0.92
100000198118	30	273	872	-0.0789	0.0712	0.99	0.99
100000198119	31	273	872	0.7643	0.0750	1.10	1.13
100000098577	32	241	872	-0.4665	0.0727	0.96	0.95
100000098576	33	241	872	0.6862	0.0742	1.16	1.20
100000098587	34	241	872	0.3864	0.0721	1.06	1.11
100000198116	35	251	872	1.5552	0.0880	1.16	1.37
100000198107	36	251	872	-0.1043	0.0712	0.96	0.96
100000198101	37	246	872	0.5609	0.0732	1.07	1.09

Table 6.3.2. The 2010 Mod-MSA Mathematics IRT Item Parameters: Grade 4 (Continued)

Item UIN	Item Seq. No.	Item Strand No	n- Count	Rasch Difficulty	SE	MS Infit	MS Outfit
100000198102	38	273	872	0.1345	0.0712	0.99	0.99
100000198103	39	273	872	0.0125	0.0711	0.98	0.97
100000198148	40	262	872	0.1701	0.0713	1.01	1.00
100000198158	41	262	872	0.0887	0.0712	0.94	0.91
100000098646	42	268	872	-1.3436	0.0847	0.89	0.77
100000186562	43	273	872	-0.7340	0.0751	0.93	0.90
100000186563	44	273	872	0.2983	0.0717	1.06	1.07
100000198094	45	246	872	-1.3436	0.0847	0.92	0.86
100000198096	46	246	872	-0.3042	0.0718	0.96	0.98
100000198129	47	257	872	-0.0789	0.0712	0.93	0.92
100000198131	48	273	872	0.7643	0.0750	1.06	1.07
100000198132	49	273	872	0.5074	0.0728	1.04	1.07
100000198093	50	246	872	-2.3400	0.1165	0.89	0.59
100000098572	51	241	872	0.5021	0.0728	0.93	0.92
100000098586	52	241	872	0.1192	0.0712	0.97	0.96
100000198104	53	246	872	-0.1706	0.0714	1.09	1.11
100000198105	54	273	872	-0.1196	0.0712	1.01	0.99
100000198106	55	273	872	0.3396	0.0718	1.03	1.04
100000198139	56	257	872	0.4230	0.0723	1.04	1.05
100000098585	57	241	872	-1.3872	0.0857	0.93	0.85
100000098582	58	241	872	-0.0484	0.0711	0.93	0.91
100000207144	59	251	872	0.4703	0.0725	1.07	1.08
100000198144	60	262	872	-0.8140	0.0760	0.86	0.79
100000198145	61	273	872	0.5394	0.0730	0.99	1.00
100000198147	62	273	872	0.1039	0.0712	1.02	1.02
100000186576	63	268	872	-1.0052	0.0786	0.91	0.88
100000098666	64	268	872	-0.0738	0.0712	1.02	1.02
100000198150	65	262	872	-0.8961	0.0770	0.87	0.80
100000198149	66	262	872	-0.2115	0.0715	0.96	0.94
100000186573	67	268	872	0.6917	0.0743	0.99	1.00
100000186574	68	273	872	0.0887	0.0712	1.01	1.02
100000186575	69	273	872	0.0887	0.0712	0.98	0.96
100000186583	70	268	872	0.0510	0.0711	1.23	1.31
100000198108	71	251	872	0.3189	0.0718	0.95	0.94
100000198122	72	251	872	0.6367	0.0738	1.06	1.06
100000098645	73	268	872	0.3189	0.0718	1.01	1.02
100000186578	74	268	872	-1.0551	0.0794	0.90	0.81
100000186580	75	268	872	-0.5198	0.0731	0.89	0.86

Table 6.3.2. The 2010 Mod-MSA Mathematics IRT Item Parameters: Grade 4 (Continued)

Item CID	Item Seq. No.	Item Strand No	n- Count	Rasch Difficulty	SE	MS Infit	MS Outfit
100000198157	76	262	872	0.8908	0.0764	1.02	1.08
100000098573	77	241	872	0.3864	0.0721	0.99	1.00
100000186560	78	273	872	-0.0789	0.0712	1.04	1.04
100000186561	79	273	872	0.7362	0.0747	1.05	1.07
100000198137	80	257	872	0.2983	0.0717	0.96	0.95
100000098571	81	241	872	-0.4032	0.0723	0.92	0.89
100000186581	82	268	872	-0.4665	0.0727	0.97	0.96
100000207143	83	268	872	-0.4137	0.0724	0.94	0.91
100000198121	84	251	872	0.4651	0.0725	1.03	1.03
100000098588	85	241	872	-0.1859	0.0714	0.98	0.98
100000098657	86	268	872	0.7306	0.0747	1.02	1.05
100000186571	87	273	872	0.2008	0.0714	1.10	1.12
100000186572	88	273	872	0.1854	0.0713	1.01	1.00
100000198125	89	257	872	-0.1808	0.0714	0.93	0.91
100000198151	90	262	872	-0.9440	0.0777	0.90	0.84
100000098653	91	268	872	0.8327	0.0757	1.04	1.06
100000186577	92	268	872	-0.9928	0.0784	0.91	0.86
100000098568	93	241	872	-0.6063	0.0738	0.91	0.85
100000186558	94	273	872	-0.2732	0.0717	0.93	0.90
100000186559	95	273	872	0.1039	0.0712	1.04	1.04
100000186567	96	268	872	-0.1502	0.0713	0.97	0.97
100000186582	97	268	872	0.5716	0.0733	1.05	1.06
100000198127	98	257	872	-0.1808	0.0714	0.93	0.91
100000098664	99	268	872	-0.0230	0.0711	0.97	0.96
100000098580	100	241	872	0.8732	0.0762	1.07	1.15
100000186579	101	268	872	0.0531	0.0711	0.96	0.95
100000198109	102	251	872	0.4915	0.0727	0.97	0.97

Note: 1. 241= Algebra, 246=Geometry, 251=Measurement, 257=Statistics, 262= Probability, 268=Numbers and Computation, and 373&374= Process
2. These analyses are based on the equating sample used with the exclusion criterion.

Table 6.3.3. The 2010 Mod-MSA Mathematics IRT Item Parameters: Grade 5

Item CID	Item Seq. No.	Item Strand No	n-Count	Rasch Difficulty	SE	MS Infit	MS Outfit
100000187371	1	268	926	-1.7441	0.0884	0.90	0.79
100000187367	2	268	926	0.0464	0.0684	1.01	1.00
100000187378	3	268	926	-0.9103	0.0727	0.94	0.92
100000099084	4	241	926	-0.8268	0.0718	0.90	0.88
100000099080	5	241	926	-0.7302	0.0709	0.91	0.88
100000099090	6	241	926	0.3591	0.0697	1.04	1.05
100000099087	7	241	926	1.0158	0.0772	1.08	1.14
100000196233	8	251	926	-0.7706	0.0712	0.91	0.87
100000196246	9	251	926	2.0213	0.1031	1.07	1.40
100000196229	10	251	926	0.0931	0.0685	0.99	0.99
100000196273	11	257	926	0.7665	0.0736	0.93	0.93
100000196043	12	273	926	0.2106	0.0689	0.96	0.96
100000196045	13	273	926	-0.1950	0.0682	1.01	1.02
100000196253	14	257	926	-0.7102	0.0707	0.89	0.87
100000196278	15	257	926	0.8656	0.0750	0.94	0.94
100000196088	16	246	926	0.6498	0.0723	1.05	1.06
100000187430	17	268	926	-0.3067	0.0684	0.96	0.95
100000187390	18	268	926	-1.1763	0.0764	0.97	0.95
100000196090	19	246	926	0.8544	0.0748	1.04	1.06
100000196081	20	246	926	0.5929	0.0717	1.05	1.06
100000187376	21	268	926	-0.2974	0.0684	1.03	1.06
100000187386	22	268	926	-1.0016	0.0739	1.03	1.04
100000187383	23	268	926	0.3156	0.0695	1.02	1.04
100000196231	24	251	926	0.3639	0.0698	1.03	1.04
100000196036	25	273	926	-0.9156	0.0728	0.96	0.95
100000196029	26	273	926	-0.2834	0.0684	0.96	0.95
100000196242	27	251	926	-0.5340	0.0694	0.93	0.91
100000099083	28	241	926	-0.2043	0.0682	1.02	1.04
100000099075	29	241	926	-0.2322	0.0683	0.93	0.92
100000099086	30	241	926	-0.6164	0.0700	0.92	0.90
100000196200	31	246	926	-0.6507	0.0702	0.95	0.94
100000196277	32	257	926	-0.0883	0.0682	0.98	0.98
100000196284	33	262	926	-0.6507	0.0702	0.92	0.88
100000196057	34	273	926	-0.0048	0.0683	0.98	0.97
100000196054	35	273	926	0.0371	0.0683	0.98	0.97
100000196279	36	262	926	0.9052	0.0755	1.01	1.05
100000099081	37	241	926	0.3931	0.0700	1.06	1.06

Table 6.3.3. The 2010 Mod-MSA Mathematics IRT Item Parameters: Grade 5 (Continued)

Item CID	Item Seq. No.	Item Strand No	n- Count	Rasch Difficulty	SE	MS Infit	MS Outfit
100000099079	38	241	926	-0.6458	0.0702	0.98	0.97
100000099088	39	241	926	-0.2554	0.0683	1.06	1.09
100000099085	40	241	926	-0.9637	0.0734	0.93	0.89
100000196237	41	251	926	0.3834	0.0699	1.09	1.10
100000196234	42	251	926	-1.2535	0.0777	0.95	0.92
100000196053	43	273	926	-0.7152	0.0707	0.93	0.90
100000196244	44	251	926	1.3858	0.0845	1.04	1.14
100000099089	45	241	926	-1.1243	0.0756	0.90	0.84
100000099091	46	241	926	-0.2508	0.0683	0.96	0.95
100000099092	47	241	926	-0.2834	0.0684	1.00	0.99
100000187365	48	273	926	0.3542	0.0697	1.00	1.00
100000187364	49	273	926	0.0931	0.0685	0.99	1.00
100000196381	50	262	926	-1.3147	0.0788	0.89	0.83
100000196281	51	262	926	0.2916	0.0693	1.04	1.04
100000187387	52	268	926	1.2615	0.0818	1.03	1.07
100000187388	53	273	926	0.3494	0.0697	1.08	1.10
100000187389	54	273	926	0.5674	0.0714	1.12	1.15
100000196270	55	257	926	0.5878	0.0716	0.95	0.95
100000196256	56	257	926	-0.2043	0.0682	0.95	0.95
100000196267	57	257	926	-1.9350	0.0938	0.92	0.80
100000099178	58	241	926	-0.2136	0.0682	0.98	0.98
100000187369	59	268	926	0.3397	0.0696	1.04	1.05
100000187380	60	268	926	0.3785	0.0699	1.05	1.05
100000187429	61	268	926	-0.3301	0.0685	0.94	0.93
100000187428	62	268	926	-0.4670	0.0691	0.94	0.92
100000187372	63	268	926	1.1509	0.0796	1.08	1.16
100000099180	64	268	926	0.1352	0.0686	0.96	0.97
100000099072	65	241	926	-0.3395	0.0685	0.92	0.90
100000187360	66	273	926	0.4274	0.0702	1.05	1.07
100000187361	67	273	926	-0.1393	0.0682	0.94	0.92
100000196260	68	257	926	0.2964	0.0693	1.10	1.13
100000196258	69	257	926	0.7182	0.0730	1.09	1.11
100000196269	70	257	926	1.2415	0.0814	0.98	1.02
100000196223	71	246	926	-0.1857	0.0682	1.01	1.03
100000196100	72	246	926	-1.5658	0.0840	0.90	0.82
100000196094	73	246	926	0.0464	0.0684	0.99	0.99
100000187373	74	273	926	0.5725	0.0715	1.01	1.01
100000187363	75	273	926	0.5068	0.0709	1.08	1.11

Table 6.3.3. The 2010 Mod-MSA Mathematics IRT Item Parameters: Grade 5 (Continued)

Item CID	Item Seq. No.	Item Strand No	n- Count	Rasch Difficulty	SE	MS Infit	MS Outfit
100000196037	76	273	926	0.0557	0.0684	1.04	1.05
100000187370	77	268	926	0.0650	0.0684	0.97	0.97
100000187391	78	268	926	0.4323	0.0703	0.97	0.97
100000187392	79	268	926	0.3494	0.0697	1.07	1.09
100000187382	80	268	926	0.3108	0.0694	1.05	1.06
100000196263	81	257	926	-0.8372	0.0719	0.96	0.94
100000196247	82	257	926	0.2964	0.0693	0.97	0.96
100000196238	83	251	926	0.4225	0.0702	1.08	1.10
100000196079	84	246	926	0.3445	0.0696	1.01	1.01
100000196025	85	273	926	-0.5291	0.0694	1.00	0.99
100000187393	86	273	926	0.9109	0.0756	1.14	1.18
100000196225	87	246	926	0.7611	0.0736	1.09	1.13
100000099177	88	241	926	-0.0001	0.0683	0.95	0.94
100000187366	89	273	926	0.1258	0.0686	1.00	1.00
100000196049	90	273	926	-0.4243	0.0689	1.00	0.99
100000196235	91	251	926	0.9280	0.0759	1.09	1.14
100000099082	92	241	926	0.1634	0.0687	1.10	1.11
100000196042	93	273	926	0.3639	0.0698	1.00	1.02
100000187385	94	268	926	-0.0698	0.0682	1.02	1.02
100000187374	95	273	926	0.1165	0.0685	1.11	1.11
100000187424	96	273	926	0.3204	0.0695	1.04	1.06
100000187379	97	268	926	-0.2881	0.0684	0.92	0.93
100000187377	98	268	926	1.1700	0.0800	1.08	1.17
100000187381	99	268	926	1.0398	0.0776	1.02	1.02
100000187375	100	268	926	0.4521	0.0704	1.06	1.07

Note: 1. 241= Algebra, 246=Geometry, 251=Measurement, 257=Statistics, 262= Probability, 268=Numbers and Computation, and 373&374= Process
2. These analyses are based on the equating sample used with the exclusion criterion.

Table 6.3.4. The 2010 Mod-MSA Mathematics IRT Item Parameters: Grade 6

Item CID	Item Seq. No.	Item Strand No	n-Count	Rasch Difficulty	SE	MS Infit	MS Outfit
100000272103	1	246	852	-1.1141	0.0789	1.02	1.05
100000272105	2	246	852	-0.6106	0.0732	1.03	1.05
100000272100	3	246	852	0.8584	0.0785	1.06	1.11
100000272095	4	246	852	1.3776	0.0880	1.03	1.09
100000272117	5	251	852	0.3108	0.0729	0.98	0.97
100000198185	6	251	852	0.3977	0.0735	0.94	0.93
100000272111	7	251	852	0.5886	0.0752	1.10	1.12
100000272115	8	251	852	0.4885	0.0742	1.11	1.11
100000272113	9	251	852	0.3055	0.0729	0.94	0.94
100000272076	10	241	852	-0.4521	0.0723	0.96	0.97
100000272073	11	241	852	-0.2201	0.0716	1.06	1.08
100000099232	12	241	852	-0.4626	0.0724	0.88	0.84
100000272096	13	246	852	-0.3021	0.0718	0.93	0.90
100000272145	14	273	852	0.0661	0.0718	1.01	1.01
100000272146	15	273	852	-0.0210	0.0716	1.05	1.06
100000198162	16	246	852	0.3156	0.0729	1.06	1.08
100000272101	17	246	852	0.1022	0.0719	1.01	1.01
100000198232	18	262	852	0.6694	0.0760	1.01	1.04
100000272084	19	262	852	0.6396	0.0757	1.18	1.22
100000198210	20	257	852	0.3908	0.0734	0.92	0.91
100000198211	21	273	852	-0.1220	0.0715	0.98	0.97
100000198212	22	273	852	-0.8737	0.0757	0.97	0.92
100000272129	23	257	852	-0.1792	0.0716	0.96	0.94
100000187836	24	268	852	-0.5550	0.0729	0.95	0.91
100000272156	25	268	852	-0.5098	0.0726	0.97	0.96
100000272158	26	268	852	0.3002	0.0728	1.09	1.09
100000272159	27	268	852	0.4177	0.0736	1.04	1.04
100000272066	28	241	852	-1.1644	0.0797	0.91	0.83
100000272077	29	241	852	0.7797	0.0774	1.05	1.08
100000272068	30	241	852	0.5438	0.0747	1.04	1.06
100000272075	31	241	852	-0.9925	0.0771	0.95	0.92
100000272072	32	241	852	-0.5679	0.0730	1.00	1.02
100000272067	33	241	852	-0.7854	0.0747	0.88	0.81
100000272131	34	257	852	0.1954	0.0723	0.99	0.99
100000272127	35	257	852	-0.6267	0.0734	0.90	0.87
100000272134	36	257	852	-0.7465	0.0744	0.94	0.93
100000273844	37	241	852	-0.0670	0.0716	1.05	1.06

Table 6.3.4. The 2010 Mod-MSA Mathematics IRT Item Parameters: Grade 6 (Continued)

Item CID	Item Seq. No.	Item Strand No	n- Count	Rasch Difficulty	SE	MS Infit	MS Outfit
100000273626	38	273	852	0.7857	0.0775	1.06	1.07
100000272143	39	273	852	-0.2713	0.0717	0.92	0.91
100000272144	40	273	852	0.1331	0.0720	0.99	0.99
100000198178	41	246	852	0.0892	0.0719	1.00	0.99
100000272099	42	246	852	0.9521	0.0799	1.10	1.18
100000272148	43	273	852	0.2581	0.0726	1.08	1.10
100000272149	44	273	852	-0.0261	0.0716	1.07	1.09
100000198235	45	262	852	0.1385	0.0720	1.05	1.05
100000272080	46	262	852	-0.9511	0.0766	0.94	0.90
100000272082	47	262	852	-0.7854	0.0747	0.94	0.94
100000272114	48	251	852	1.0429	0.0814	1.02	1.09
100000272116	49	251	852	0.3533	0.0732	0.96	0.96
100000198186	50	251	852	0.3190	0.0729	0.93	0.93
100000272112	51	251	852	0.6396	0.0757	1.11	1.14
100000099325	52	241	852	-0.5054	0.0726	0.84	0.80
100000272128	53	257	852	-0.3227	0.0718	0.97	0.97
100000272125	54	257	852	0.1486	0.0721	1.02	1.02
100000272069	55	241	852	-0.4469	0.0723	0.93	0.92
100000272155	56	268	852	1.2143	0.0845	1.17	1.27
100000272166	57	268	852	0.4070	0.0736	0.99	0.99
100000272167	58	268	852	1.1235	0.0828	0.98	0.98
100000187852	59	268	852	-0.3809	0.0720	0.91	0.88
100000272065	60	241	852	0.2110	0.0723	0.92	0.91
100000198218	61	257	852	-0.1537	0.0715	0.98	0.97
100000198220	62	273	852	-0.4037	0.0721	0.93	0.91
100000198219	63	273	852	-0.1446	0.0715	0.94	0.92
100000187841	64	268	852	-0.5203	0.0727	0.95	0.93
100000272161	65	268	852	1.0297	0.0811	1.04	1.09
100000272163	66	268	852	0.1435	0.0721	0.94	0.93
100000198170	67	246	852	1.4827	0.0905	1.11	1.25
100000272104	68	246	852	0.1538	0.0721	1.06	1.07
100000272150	69	273	852	0.1902	0.0723	1.05	1.06
100000272151	70	273	852	0.9585	0.0800	1.14	1.17
100000272098	71	246	852	-0.5203	0.0727	0.98	0.97
100000272071	72	241	852	-1.2222	0.0806	0.96	0.96
100000099236	73	241	852	-0.3322	0.0718	0.91	0.89
100000273837	74	241	852	-0.7631	0.0745	0.93	0.90
100000273598	75	273	852	-0.1333	0.0715	1.03	1.04

Table 6.3. 4. The 2010 Mod-MSA Mathematics IRT Item Parameters: Grade 6 (Continued)

Item CID	Item Seq. No.	Item Strand No	n- Count	Rasch Difficulty	SE	MS Infit	MS Outfit
100000272141	76	273	852	-0.6375	0.0734	0.97	0.96
100000198202	77	257	852	-0.4955	0.0725	0.90	0.87
100000272126	78	257	852	-0.2662	0.0717	0.97	0.96
100000272133	79	257	852	0.4394	0.0738	0.94	0.93
100000272132	80	257	852	-0.6699	0.0737	0.93	0.94
100000272165	81	268	852	-0.2150	0.0716	1.09	1.11
100000272152	82	273	852	0.4340	0.0738	1.03	1.03
100000273858	83	273	852	0.3373	0.0731	1.07	1.08
100000272160	84	268	852	-0.9278	0.0763	0.93	0.89
100000187850	85	268	852	-0.7997	0.0749	0.93	0.92
100000272157	86	268	852	1.5820	0.0930	0.98	1.09
100000272154	87	273	852	0.1022	0.0719	1.09	1.12
100000272153	88	273	852	-0.4053	0.0721	0.99	0.99
100000272162	89	268	852	-0.2867	0.0717	0.96	0.96
100000099252	90	241	852	0.6055	0.0753	1.10	1.12
100000198165	91	273	852	-0.0184	0.0716	0.97	0.96
100000272097	92	246	852	-0.1486	0.0715	1.00	0.99
100000187833	93	273	852	0.5310	0.0746	1.01	1.01
100000272102	94	246	852	0.0507	0.0718	1.16	1.20
100000198174	95	273	852	0.1881	0.0722	1.02	1.03
100000272164	96	268	852	0.6282	0.0756	1.04	1.06

Note: 1. 241= Algebra, 246=Geometry, 251=Measurement, 257=Statistics, 262= Probability, 268=Numbers and Computation, and 373&374= Process
2. These analyses are based on the equating sample used with the exclusion criterion.

Table 6.3.5. The 2010 Mod-MSA Mathematics IRT Item Parameters: Grade 7

Item CID	Item Seq. No.[1]	Item Strand No	n-Count	Rasch Difficulty	SE	MS Infit	MS Outfit
100000322134	1	246	1000	-0.6553	0.0677	0.94	0.93
100000273428	2	273	1000	0.8808	0.0722	1.05	1.07
100000273431	3	246	1000	0.9870	0.0737	1.10	1.14
100000272267	4	273	1000	-1.5249	0.0801	1.01	1.10
100000197499	5	257	1000	-0.4387	0.0664	0.93	0.91
100000272217	6	257	1000	-0.4978	0.0667	1.01	1.03
100000322127	7	246	1000	1.4048	0.0815	0.97	0.97
100000322131	8	246	1000	1.7655	0.0907	1.08	1.23
100000197494	9	251	1000	0.8482	0.0718	1.10	1.14
100000322136	10	251	1000	1.0089	0.0741	1.15	1.22
100000322138	11	251	1000	1.0143	0.0742	0.99	1.03
100000197496	12	251	1000	1.4407	0.0823	1.02	1.07
100000322166	13	241	1000	-0.6370	0.0676	0.96	0.95
100000322165	14	241	1000	0.2217	0.0664	1.03	1.03
100000322169	15	241	1000	0.6849	0.0698	1.08	1.09
100000099488	16	268	1000	-2.0862	0.0953	1.15	0.96
100000322151	17	268	1000	0.6462	0.0694	1.02	1.04
100000322141	18	268	1000	-0.2533	0.0658	0.98	0.97
100000322152	19	268	1000	-0.1758	0.0657	1.00	0.99
100000322140	20	268	1000	-0.4140	0.0663	1.01	1.02
100000287243	21	273	1000	-1.3008	0.0757	0.96	0.91
100000272268	22	273	1000	-0.6325	0.0675	1.01	1.02
100000287244	23	251	1000	1.6696	0.0880	0.99	1.05
100000272270	24	273	1000	0.7142	0.0702	1.06	1.09
100000322137	25	251	1000	0.7787	0.0709	1.05	1.08
100000322139	26	251	1000	1.0198	0.0742	1.00	1.01
100000272201	27	251	1000	0.4451	0.0677	1.13	1.15
100000322164	28	241	1000	-0.2792	0.0659	0.99	0.98
100000272171	29	241	1000	-0.5378	0.0669	1.04	1.05
100000099420	30	241	1000	-1.0134	0.0713	1.17	1.30
100000099421	31	241	1000	-1.1523	0.0733	0.98	0.96
100000272271	32	273	1000	0.4679	0.0678	1.03	1.03
100000272216	33	257	1000	0.2305	0.0664	1.07	1.08
100000272272	34	273	1000	0.0392	0.0658	1.01	1.01
100000322175	35	262	1000	-0.4009	0.0662	0.98	0.97
100000322172	36	262	1000	0.7636	0.0707	1.00	1.01
100000197528	37	262	1000	0.4196	0.0675	0.97	0.97

Table 6.3.5. The 2010 Mod-MSA Mathematics IRT Item Parameters: Grade 7 (Continued)

Item CID	Item Seq. No.[1]	Item Strand No	n- Count	Rasch Difficulty	SE	MS Infit	MS Outfit
100000374151	38	273	1000	0.4109	0.0674	1.10	1.12
100000374152	39	246	1000	0.1404	0.0661	1.11	1.12
100000196052	40	273	1000	0.1294	0.0660	1.12	1.13
100000196055	41	273	1000	0.5938	0.0689	1.02	1.04
100000322129	42	246	1000	-0.6098	0.0674	0.97	0.96
100000197481	43	246	1000	-0.3334	0.0660	0.91	0.89
100000273423	44	273	1000	0.0565	0.0658	1.02	1.02
100000273427	46		1000	0.4725	0.0679	1.12	1.13
100000272203	48	241	1000	-0.1586	0.0657	0.92	0.90
100000322153	49		1000	-0.4140	0.0663	0.90	0.88
100000272246	50	251	1000	0.8652	0.0720	1.09	1.11
100000322154	51	268	1000	-0.5872	0.0672	1.00	1.00
100000322128	52	268	1000	0.8860	0.0723	1.03	1.09
100000322173	53	268	1000	0.6127	0.0691	1.11	1.12
100000322174	54	246	1000	0.9122	0.0726	1.10	1.16
100000273415	55	262	1000	0.8860	0.0723	1.11	1.14
100000273416	56	262	1000	1.6088	0.0864	1.02	1.09
100000272274	57	273	1000	0.2878	0.0667	1.04	1.05
100000272186	58	262	1000	-0.7524	0.0685	0.99	1.00
100000322135	59	273	1000	-0.7618	0.0686	0.92	0.88
100000322132	60	246	1000	0.0047	0.0657	1.06	1.06
100000272187	61	246	1000	0.0694	0.0659	0.99	0.98
100000374196	63	246	1000	0.6414	0.0694	0.97	0.98
100000272248	64	246	1000	-0.4228	0.0663	1.01	1.01
100000322146	65		1000	0.6995	0.0700	1.05	1.09
100000197501	66	268	1000	0.3822	0.0672	1.06	1.06
100000322158	67	268	1000	0.1692	0.0662	0.83	0.81
100000322160	68	268	1000	0.0047	0.0657	0.91	0.90
100000322163	69	257	1000	0.0910	0.0659	0.97	0.97
100000272174	70	241	1000	0.2878	0.0667	0.91	0.90
100000099504	71	241	1000	0.6547	0.0695	0.98	1.01
100000322142	72	241	1000	-1.5249	0.0801	0.96	0.91
100000167818	73	241	1000	-0.4248	0.0663	0.84	0.82
100000322143	74	268	1000	-1.5638	0.0809	0.93	0.87
100000322147	75	268	1000	-0.0598	0.0657	0.96	0.96
100000099493	76	268	1000	-0.5911	0.0672	0.90	0.88
100000273417	77	268	1000	0.0435	0.0658	1.06	1.07
100000273444	78	268	1000	0.0392	0.0658	0.90	0.88

Table 6.3.5. The 2010 Mod-MSA Mathematics IRT Item Parameters: Grade 7 (Continued)

Item CID	Item Seq. No.[1]	Item Strand No	n- Count	Rasch Difficulty	SE	MS Infit	MS Outfit
100000273445	79	273	1000	0.6558	0.0695	1.04	1.06
100000197524	80	262	1000	1.6427	0.0873	1.10	1.13
100000272247	81	268	1000	-0.9105	0.0701	0.97	0.94
100000322149	82	268	1000	-0.8909	0.0699	0.89	0.84
100000322150	83	268	1000	-0.0984	0.0657	1.03	1.03
100000322144	84	268	1000	-1.1891	0.0738	0.96	0.93
100000322148	85	268	1000	-0.5737	0.0671	0.87	0.85
100000099410	86	241	1000	0.5339	0.0684	1.00	1.03
100000322161	87	241	1000	0.2657	0.0666	0.98	0.97
100000099413	88	241	1000	1.0713	0.0751	0.99	1.00
100000322157	89	241	1000	-1.2275	0.0745	0.98	0.96
100000099404	90	241	1000	0.1073	0.0660	0.89	0.88
100000196255	91	273	1000	-0.3721	0.0661	1.01	1.01
100000197522	92	257	1000	-0.8505	0.0694	1.11	1.13
100000196257	93	273	1000	0.3308	0.0669	1.01	1.01
100000196261	94	273	1000	-0.1444	0.0657	1.09	1.10
100000322171	95	241	1000	-0.0039	0.0657	0.89	0.88
100000322162	96	241	1000	0.0608	0.0658	0.96	0.97
100000322159	97	241	1000	0.2569	0.0665	0.92	0.92
100000099490	98	268	1000	0.2911	0.0667	1.00	0.99

Note: 1. Item #s 46, 49, and 65 were not scored
2. 241= Algebra, 246=Geometry, 251=Measurement, 257=Statistics, 262= Probability, 268=Numbers and Computation, and 373&374= Process
3. These analyses are based on the equating sample used with the exclusion criterion.

Table 6.3.6. The 2010 Mod-MSA Mathematics IRT Item Parameters: Grade 8

Item CID	Item Seq. No.	Item Strand No	n-Count	Rasch Difficulty	SE	MS Infit	MS Outfit
100000322198	1	241	1017	-0.2442	0.0650	1.14	1.23
100000322187	2	241	1017	0.1063	0.0662	1.07	1.08
100000197359	3	251	1017	-0.6919	0.0659	0.98	0.97
100000272279	4	251	1017	1.6028	0.0915	1.04	1.04
100000272278	5	251	1017	0.2661	0.0673	1.08	1.10
100000272340	6	241	1017	-0.1682	0.0651	0.99	0.99
100000099548	7	241	1017	-1.2618	0.0711	0.90	0.86
100000322121	8	262	1017	-0.4506	0.0651	0.98	0.97
100000322186	9	241	1017	-1.3614	0.0726	1.00	1.02
100000322122	10	262	1017	-0.6724	0.0658	1.11	1.16
100000322120	11	262	1017	-0.4971	0.0652	0.95	0.93
100000099550	12	241	1017	0.1130	0.0663	0.96	0.95
100000272296	13	273	1017	0.8104	0.0738	1.09	1.15
100000272337	14	241	1017	0.7461	0.0728	1.00	1.00
100000272295	15	273	1017	0.6886	0.0720	1.04	1.06
100000272297	16	273	1017	-0.3452	0.0650	1.06	1.07
100000272323	17	257	1017	-0.0706	0.0654	1.08	1.12
100000322119	18	257	1017	-0.6207	0.0656	1.00	0.98
100000322118	19	257	1017	-0.1682	0.0651	0.94	0.93
100000322084	20	246	1017	0.5331	0.0700	1.08	1.09
100000197347	21	246	1017	0.2121	0.0669	1.01	1.02
100000322081	22	246	1017	-0.4802	0.0651	0.99	0.98
100000272309	23	246	1017	0.4847	0.0694	1.11	1.13
100000322209	24	268	1017	-0.4379	0.0651	1.01	0.99
100000322208	25	268	1017	-0.9425	0.0676	0.95	0.93
100000322205	26	268	1017	0.0367	0.0658	1.07	1.07
100000322207	27	268	1017	-1.6002	0.0766	0.94	0.89
100000197387	28	262	1017	0.3845	0.0684	0.99	0.98
100000286862	29	273	1017	0.2078	0.0669	1.12	1.17
100000272790	30	273	1017	-0.6465	0.0657	0.94	0.92
100000286872	31	262	1017	0.1457	0.0665	1.09	1.11
100000373799	32	268	1017	0.0630	0.0660	0.98	0.98
100000272368	33	268	1017	0.4370	0.0689	1.14	1.18
100000322200	34	268	1017	0.4181	0.0687	0.94	0.94
100000099626	35	268	1017	-1.2755	0.0713	0.96	0.97
100000286792	36	273	1017	-0.0663	0.0654	1.02	1.02
100000272298	37	273	1017	0.7941	0.0735	1.06	1.08

Table 6.3.6. The 2010 Mod-MSA Mathematics IRT Item Parameters: Grade 8 (Continued)

Item CID	Item Seq. No.[1]	Item Strand No	n- Count	Rasch Difficulty	SE	MS Infit	MS Outfit
100000286786	38	251	1017	-1.5026	0.0749	1.01	1.05
100000272300	39	273	1017	1.5778	0.0908	1.04	1.10
100000322079	40	251	1017	-0.0321	0.0655	1.08	1.08
100000322078	41	251	1017	-0.6680	0.0658	0.99	1.01
100000197367	42	257	1017	0.4466	0.0690	1.01	1.02
100000286859	43	273	1017	0.4703	0.0692	0.95	0.95
100000272305	44	273	1017	0.6022	0.0708	0.96	0.96
100000286860	45	257	1017	0.7834	0.0733	0.99	1.01
100000322116	46	257	1017	-0.2568	0.0650	1.09	1.09
100000322117	47	257	1017	-1.9559	0.0846	0.93	0.82
100000286845	48	273	1017	0.0540	0.0659	0.99	0.99
100000272301	49	273	1017	1.5290	0.0894	0.99	1.08
100000286846	50	246	1017	0.6274	0.0711	1.03	1.08
100000322080	51	246	1017	-0.1259	0.0652	1.00	1.00
100000272353	52	262	1017	-0.2062	0.0651	1.01	1.01
100000167565	53	273	1017	-0.1516	0.0652	1.02	1.02
100000167566	54	273	1017	0.6133	0.0709	1.04	1.05
100000174558	55	262	1017	0.7327	0.0726	0.98	0.99
100000322204	56	268	1017	0.4134	0.0686	1.02	1.03
100000322206	57	268	1017	-1.8315	0.0816	0.95	0.89
100000322199	58	268	1017	0.1106	0.0662	1.07	1.08
100000099639	59	268	1017	0.0583	0.0660	0.95	0.95
100000272308	60	246	1017	0.0108	0.0657	1.00	1.04
100000197322	61	246	1017	-0.2045	0.0651	1.01	1.00
100000322082	62	246	1017	0.0627	0.0660	0.99	1.01
100000322115	63	257	1017	-1.4201	0.0735	0.95	0.92
100000197365	64	257	1017	-0.0053	0.0657	0.97	0.96
100000272339	65	241	1017	-0.5396	0.0653	0.92	0.91
100000197377	66	273	1017	-0.9339	0.0675	1.04	1.05
100000197373	67	273	1017	0.0276	0.0658	1.02	1.02
100000197375	68	257	1017	1.2281	0.0818	0.92	0.96
100000197376	69	273	1017	-1.1337	0.0695	1.06	1.04
100000322201	70	268	1017	-2.5038	0.1021	0.97	0.89
100000322203	71	268	1017	0.7198	0.0724	1.00	1.01
100000322193	72	241	1017	-0.2147	0.0651	1.04	1.04
100000099553	73	241	1017	-0.9660	0.0678	0.88	0.84
100000322185	74	241	1017	-0.4084	0.0650	0.94	0.93
100000322195	75	241	1017	-0.0150	0.0656	0.97	0.96

Table 6.3.6. The 2010 Mod-MSA Mathematics IRT Item Parameters: Grade 8 (Continued)

Item CID	Item Seq. No.[1]	Item Strand No	n- Count	Rasch Difficulty	SE	MS Infit	MS Outfit
100000373853	76	273	1017	-0.2869	0.0650	0.92	0.92
100000167561	77	273	1017	-0.6825	0.0658	0.94	0.92
100000373854	78	241	1017	-0.2434	0.0650	0.90	0.88
100000322188	79	241	1017	-0.6293	0.0656	0.88	0.86
100000197319	80	246	1017	0.2761	0.0674	0.99	0.99
100000322196	81	241	1017	-0.9562	0.0677	1.00	0.99
100000322191	82	241	1017	-0.3621	0.0650	0.99	1.00
100000322189	83	241	1017	-1.5423	0.0756	0.90	0.81
100000099647	84	241	1017	-0.2686	0.0650	0.97	0.96
100000286880	85	273	1017	0.2571	0.0672	1.03	1.03
100000272303	86	273	1017	-0.5737	0.0654	1.02	1.02
100000286879	87	241	1017	0.1150	0.0663	1.03	1.04
100000286793	88	273	1017	0.1281	0.0663	1.04	1.03
100000286797	89	257	1017	0.1722	0.0666	0.97	0.96
100000272293	90	273	1017	-1.4147	0.0734	0.97	0.94
100000272294	91	273	1017	-0.9062	0.0673	0.97	0.95
100000322192	92	241	1017	-0.5694	0.0654	0.93	0.91
100000322190	93	241	1017	0.6732	0.0717	1.00	1.02
100000322202	94	268	1017	-1.6002	0.0766	0.95	0.89
100000272367	95	268	1017	-1.7854	0.0805	0.96	0.91
100000099631	96	268	1017	0.5341	0.0700	1.07	1.09
100000322197	97	241	1017	0.0757	0.0660	0.93	0.92
100000322194	98	241	1017	-0.8881	0.0671	0.99	1.00

Note: 1. 241= Algebra, 246=Geometry, 251=Measurement, 257=Statistics, 262= Probability, 268=Numbers and Computation, and 373&374= Process
2. These analyses are based on the equating sample used with the exclusion criterion.