

Technical Documentation of  
Reading, Writing, Mathematics, and Science Items and Tasks for  
Alaska Alternate Assessment

Data from 2005 Administration

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This technical report includes the following analyses for reading (tables 1a-1e), writing (tables 2a-2e), mathematics (tables 3a-3e), and science (tables 4a-4e) alternate assessments conducted in Oregon in May 2005:

- a. Intercorrelations among items within tasks including reliability coefficients (Cronbach's alpha) using classical test theory (CTT).
- b. Item and person fit statistics including task reliability using item response theory (IRT) in which items and tasks are scaled together.
- c. Intercorrelations among tasks within each subject area.
- d. Differential item functioning (DIF) noting differences between grade band groups (elementary, middle, and high) when ability is controlled; individual items are noted where DIF is present in every grade band pair.
- e. Descriptive statistics for each task, including mean, standard deviation, and count in three grade bands: elementary, middle, and high.

The results confirm the technical adequacy of this alternate assessment: intercorrelations among items are moderate (most likely do to restricted range and minimal variance); the tasks are very reliable using either CTT or IRT; intercorrelations among tasks are moderate indicating both some shared and some unique variance; DIF appears with some items in a few tasks; differences in grade band performance is surprisingly slight.

Table 1a: Reading SPSS Item Analysis Summary by Task

Task	# of Items	Inter-Item Correlations			Alpha Coefficient
		Mean	Minimum	Maximum	
1	8	.169	.079	.331	.528
2	8	.294	.128	.685	.771
3	8	.379	.193	.518	.809
4	6	.409	.286	.535	.805
5	8	.676	.605	.752	.939
6	8	.480	.344	.682	.867
7	8	.576	.491	.677	.908
8	8	.520	.432	.609	.896
9	8	.421	.249	.534	.854
10	5	.637	.479	.746	.879
11	9	.200	-.394	.974	.818
12	6	.381	.282	.564	.786
13	6	.402	.297	.542	.796

Table 1b: Reading IRT and IPL Item Analysis Summaries by Task

Task	# of items	Item Fit Statistics			Person Fit Statistics			
		Mean	Min.	Max.	Reliability	Mean	Min.	Max.
1	8	.95	.67	1.25	.91	.95	.13	9.90
2	8	1.02	.90	1.15	.88	1.02	.10	9.40
3	8	.95	.57	1.62	.91	.95	.17	4.96
4	6	1.03	.79	1.34	.00	1.03	.00	4.36
5	8	.69	.54	.86	.00	.66	.00	9.90
6	8	.95	.41	1.25	.90	.96	.24	6.91
7	8	.97	.75	1.13	.92	.97	.01	6.50
8	8	1.00	.85	1.12	.00	1.00	.00	7.97
9	8	1.07	.90	1.39	.90	1.05	.08	9.90
10	5	1.07	.93	1.26	.93	1.00	.04	9.90
11	9	NA	NA	NA	NA	NA	NA	NA
12	6	1.04	.78	1.38	.91	1.03	.07	9.90
13	6	1.06	.81	1.52	.89	1.03	.08	9.90

Table 1c: Reading Task Correlations and Average Correlation and Correlation Range by Task

Task	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1	0.332	0.308	0.321	0.257	0.306	0.215	0.190	0.164	0.208	0.048	0.299	0.266
2	0.332	1	0.265	0.329	0.275	0.268	0.261	0.458	0.472	0.421	0.327	0.289	0.237
3	0.308	0.265	1	0.261	0.330	0.491	0.369	0.429	0.345	0.438	0.117	0.082	0.111
4	0.321	0.329	0.261	1	0.532	0.412	0.372	0.289	0.209	0.273	0.013	0.626	0.586
5	0.257	0.275	0.330	0.532	1	0.549	0.636	0.430	0.340	0.408	0.079	0.423	0.425
6	0.306	0.268	0.491	0.412	0.549	1	0.600	0.399	0.335	0.380	0.022	0.316	0.333
7	0.215	0.261	0.369	0.372	0.636	0.600	1	0.565	0.471	0.558	0.182	0.329	0.339
8	0.190	0.458	0.429	0.289	0.430	0.399	0.565	1	0.786	0.807	0.499	0.252	0.265
9	0.164	0.472	0.345	0.209	0.340	0.335	0.471	0.786	1	0.747	0.570	0.181	0.179
10	0.208	0.421	0.438	0.273	0.408	0.380	0.558	0.807	0.747	1	0.485	0.243	0.262
11	0.048	0.327	0.117	0.013	0.079	0.022	0.182	0.499	0.570	0.485	1	0.097	0.149
12	0.299	0.289	0.082	0.626	0.423	0.316	0.329	0.252	0.181	0.243	0.097	1	0.714
13	0.266	0.237	0.111	0.586	0.425	0.333	0.339	0.265	0.179	0.262	0.149	0.714	1

Task	# of Items	Mean	Min.	Max.
1	8	0.243	0.048	0.332
2	8	0.328	0.237	0.472
3	8	0.296	0.082	0.491
4	6	0.352	0.013	0.626
5	8	0.390	0.079	0.636
6	8	0.368	0.022	0.600
7	8	0.408	0.182	0.636
8	8	0.447	0.190	0.807
9	8	0.400	0.164	0.786
10	5	0.436	0.208	0.807
11	9	0.216	0.013	0.570
12	6	0.321	0.082	0.714
13	6	0.322	0.111	0.714

Table 1d: Reading Differential Item Functioning by Grade Level

Task	# of Items	Items with Significant Difference Across Grade Levels (sign indicates sign of <i>t</i> -score)		
		Elementary-Middle	Elementary-High	Middle-High
1	8	-1, -3, -5, -7	-2, 3, -4	-2
2	8	-1, -3, 4, -6	-1, -3, 4	
3	8	-3		
4	6	1, 2, -5, -6	1, 2, -4, -6	2
5	8	8		
6	8	6	6	
7	8	2	1, -3	1
8	8	1, 3, -4, -6, 8	-2, 3, -4, 8	-5, 8
9	8	1, -5	1, 3, -4, -5	-4, -5, 8
10	5	-2, 4	-2	
11	9			
12	6			
13	6	-4, 5	5	5

Table 1e: Reading Task Descriptive Statistics by Grade Level

Reading Task	Elementary			Jr. High			High School		
	Mean	SD	<i>n</i>	Mean	SD	<i>n</i>	Mean	SD	<i>n</i>
1	15.440	1.258	2008	15.507	1.197	759	15.774	0.723	208
2	9.495	4.245	1930	11.110	3.847	737	12.716	3.177	204
3	15.260	2.106	2040	15.235	2.346	757	15.502	1.536	207
4	8.715	3.515	1954	7.883	3.812	708	7.995	3.546	198
5	16.928	5.912	1906	15.086	6.631	689	14.682	6.606	186
6	7.265	1.600	1945	6.926	2.010	731	6.880	2.050	191
7	20.244	5.525	1874	19.441	6.200	664	18.944	6.486	178
8	12.283	4.227	1918	12.623	4.343	703	13.399	3.781	188
9	10.342	4.125	1854	11.193	4.448	680	11.590	4.556	183
10	13.168	4.283	1910	13.634	4.422	697	14.230	4.156	187
11	147.239	65.700	1043	171.264	79.085	454	199.569	93.094	130
12	9.009	3.198	1394	8.501	3.290	509	8.868	3.103	144
13	8.992	2.780	1227	8.752	3.154	463	9.148	2.939	115

Table 2a: Writing SPSS Item Analysis Summaries by Task

Task	# of Items	Inter-Item Correlations			Alpha Coefficient
		Mean	Minimum	Maximum	
1	10	.465	.326	.614	.896
2	8	.651	.588	.748	.636
3	3	.773	.740	.838	.865
4	4	.578	.421	.879	.841
5	10	.486	.339	.598	.890
6	3	.814	.788	.858	.875
7	8	.104	-.029	.292	.460
8	3	.849	.817	.884	.825
9	5	.571	.395	.886	.748
10	5	.618	.401	.865	.766

*Table 2b: Writing IRT and IPL Item Analysis Summaries by Task*

Task	# of items	Item Fit Statistics			Person Fit Statistics			
		Mean	Min.	Max.	Reliability	Mean	Min.	Max.
1	10	1.00	.70	1.48	.90	1.00	.12	2.87
2	8	1.00	.91	1.04	.92	1.00	.09	3.92
5	10	.97	.76	1.25	.91	.97	.07	9.90
7	8	.96	.72	1.17	.87	.96	.59	2.92

*Table 2c: Writing Task Correlations and Average Correlation and Correlation Range by Task*

Task	1	2	3	4	5	6	7	# of Items	Mean Cor	Min. Cor.	Max. Cor.
1	1	0.791	0.656	0.197	0.261	0.254	0.176	10	0.389	0.176	0.791
2	0.791	1	0.735	0.171	0.382	0.307	0.163	8	0.425	0.163	0.791
3	0.656	0.735	1	0.235	0.461	0.461	0.218	3	0.461	0.218	0.735
4	0.197	0.171	0.235	1	0.128	0.127	0.005	4	0.144	0.005	0.235
5	0.261	0.382	0.461	0.128	1	0.773	0.355	10	0.393	0.128	0.773
6	0.254	0.307	0.461	0.127	0.773	1	0.429	3	0.392	0.127	0.773
7	0.176	0.163	0.218	0.005	0.355	0.429	1	8	0.224	0.005	0.429

Table 2d: Writing Differential Item Functioning by Grade Level

Task	# of Items	Items with Significant Difference Across Grade Levels (sign indicates sign of <i>t</i> -score)		
		Elementary-Middle	Elementary-High	Middle-High
1	10	-4, -5, 7, 8, 10	-5, 10	
2	8		-1, 4	4
5	10	6	6, -9	
7	8	6, -8	6, -8	

Technical Adequacy of Tasks and Items  
Page 12

*Table 2e: Writing Task Descriptive Statistics by Grade Level*

Writing Task	Elementary			Jr. High			High School		
	Mean	SD	<i>n</i>	Mean	SD	<i>n</i>	Mean	SD	<i>n</i>
1	19.054	2.418	647	18.722	3.188	389	19.257	1.862	202
2	30.548	3.910	640	29.798	5.488	391	30.365	4.061	200
3	44.034	9.563	654	43.899	10.100	396	45.348	7.548	204
4	0.879	0.196	646	0.886	0.208	391	0.937	0.146	202
5	28.879	9.105	602	29.127	10.203	369	29.887	9.552	185
6	33.816	16.408	603	35.481	17.743	364	37.596	16.747	188
7	6.135	1.483	595	6.208	1.559	371	6.353	1.407	184
8	0.710	1.084	526	0.707	0.269	320	0.733	0.284	170
9	0.570	0.264	481	0.618	0.271	279	0.662	0.584	153
10	0.406	0.378	430	0.528	0.561	267	0.577	0.542	138

Technical Adequacy of Tasks and Items  
Page 13

*Table 3a: Math SPSS Item Analysis Summary by Task*

Task	# of Items	Inter-Item Correlations			Alpha Coefficient
		Mean	Minimum	Maximum	
1	8	.410	.166	.588	.844
2	8	.628	.445	.802	.873
3	8	.215	.040	.524	.690
4	10	.569	.469	.704	.890
5	4	.360	.279	.505	.683
6	4	.282	.222	.409	.560
7	9	.363	.189	.746	.773
8	3	.272	.228	.319	.509
9	5	.342	.244	.645	.716
10	4	.389	.285	.705	.684
11	1	NA	NA	NA	NA
12	2	.532	.532	.532	.692
13	5	.338	.206	.431	.719
14	7	.270	.112	.470	.664
15	4	.386	.328	.458	.703
16	5	.168	.034	.403	.494
17	5	.582	.338	.663	.845
18	4	.239	.178	.281	.558
19	3	.407	.295	.543	.636
20	2	.636	.636	.636	.775
21	2	.613	.613	.613	.737
22	1	NA	NA	NA	NA

Technical Adequacy of Tasks and Items  
Page 14

*Table 3b: Math IRT and IPL Item Analysis Summaries by Task*

Task	# of items	Item Fit Statistics			Person Fit Statistics			
		Mean	Min.	Max.	Reliability	Mean	Min.	Max.
1	8	1.03	0.57	1.81	0.90	1.03	0.38	3.85
2	8	1.16	0.85	2.36	0.93	1.16	0.07	9.54
3	8	1.14	0.83	1.56	0.88	1.05	0.07	9.90
4	10	0.96	0.69	1.36	0.93	0.96	0.11	4.16
5	4	0.98	0.86	1.18	0.90	0.98	0.29	3.59
6	4	1.14	0.87	1.61	0.89	1.06	0.06	9.90
7	9	1.02	0.49	2.48	0.91	0.99	0.25	9.90
8	3	0.98	0.89	1.08	0.86	0.98	0.12	9.90
9	5	1.00	0.72	1.42	0.90	1.00	0.18	6.32
10	4	0.94	0.60	1.31	0.87	0.92	0.06	9.90
11	1	NA	NA	NA	NA	NA	NA	NA
12	2	1.00	1.00	1.00	0.00	1.00	0.42	2.41
13	5	1.02	0.84	1.27	0.90	0.98	0.04	9.90
14	7	1.11	0.73	1.78	0.85	0.90	0.14	9.90
15	4	1.02	0.83	1.11	0.84	0.99	0.06	9.90
16	5	3.75	1.40	9.90	0.62	0.66	1.97	9.90
17	5	1.03	0.75	1.65	0.00	1.03	0.00	9.90
18	4	1.00	0.89	1.08	0.91	1.00	0.28	2.39
19	3	0.98	0.92	1.03	0.35	0.86	0.00	9.90
20	2	NA	NA	NA	NA	NA	NA	NA
21	2	NA	NA	NA	NA	NA	NA	NA
22	1	NA	NA	NA	NA	NA	NA	NA

Technical Adequacy of Tasks and Items  
Page 15

*Table 3c: Math Task Correlations and Average Correlation and Correlation Range by Task*

Task	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	1	0.386	0.260	0.460	0.227	0.202	0.298	0.158	0.266	0.208	0.129	0.139	0.124	0.184
2	0.386	1	0.154	0.676	0.343	0.287	0.382	0.207	0.33	0.281	0.208	0.206	0.187	0.327
3	0.260	0.154	1	0.265	0.182	0.187	0.253	0.201	0.235	0.201	0.112	0.144	0.250	0.098
4	0.460	0.676	0.265	1	0.394	0.363	0.535	0.301	0.514	0.578	0.347	0.390	0.441	0.376
5	0.227	0.343	0.182	0.394	1	0.553	0.464	0.403	0.572	0.286	0.443	0.438	0.420	0.430
6	0.202	0.287	0.187	0.363	0.553	1	0.449	0.402	0.546	0.292	0.463	0.424	0.429	0.386
7	0.298	0.382	0.253	0.535	0.464	0.449	1	0.412	0.542	0.451	0.402	0.398	0.482	0.397
8	0.158	0.207	0.201	0.301	0.403	0.402	0.412	1	0.445	0.247	0.31	0.324	0.377	0.276
9	0.266	0.330	0.235	0.514	0.572	0.546	0.542	0.445	1	0.412	0.487	0.512	0.575	0.456
10	0.208	0.281	0.201	0.578	0.286	0.292	0.451	0.247	0.412	1	0.349	0.372	0.496	0.328
11	0.129	0.208	0.112	0.347	0.443	0.463	0.402	0.31	0.487	0.349	1	0.434	0.418	0.372
12	0.139	0.206	0.144	0.390	0.438	0.424	0.398	0.324	0.512	0.372	0.434	1	0.474	0.386
13	0.124	0.187	0.25	0.441	0.420	0.429	0.482	0.377	0.575	0.496	0.418	0.474	1	0.417
14	0.184	0.327	0.098	0.376	0.43	0.386	0.397	0.276	0.456	0.328	0.372	0.386	0.417	1
15	0.107	0.238	0.114	0.323	0.532	0.527	0.433	0.383	0.571	0.327	0.492	0.492	0.512	0.517
16	-0.007	0.084	0.115	0.195	0.264	0.331	0.266	0.234	0.317	0.198	0.275	0.285	0.346	0.232
17	0.067	0.125	0.157	0.357	0.286	0.409	0.445	0.256	0.359	0.448	0.378	0.371	0.469	0.311
18	0.014	0.101	0.141	0.238	0.286	0.349	0.311	0.235	0.362	0.283	0.313	0.314	0.366	0.248
19	0.162	0.168	0.134	0.487	0.267	0.291	0.372	0.217	0.36	0.408	0.287	0.347	0.371	0.246
20	0.096	0.174	0.116	0.408	0.275	0.297	0.328	0.168	0.318	0.376	0.328	0.318	0.353	0.270
21	0.064	0.129	0.143	0.326	0.228	0.276	0.307	0.189	0.313	0.341	0.302	0.269	0.342	0.236
22	0.047	0.135	0.154	0.366	0.293	0.366	0.379	0.256	0.374	0.415	0.393	0.344	0.452	0.289

Technical Adequacy of Tasks and Items  
Page 16

*Table 3c: Math Task Correlations and Average Correlation and Correlation Range by Task (continued)*

Task	15	16	17	18	19	20	21	22	# of Items	Mean Corr.	Min. Corr.	Max. Corr.
1	0.107	-0.007	0.067	0.014	0.162	0.096	0.064	0.047	8	0.171	-0.007	0.460
2	0.238	0.084	0.125	0.101	0.168	0.174	0.129	0.135	8	0.244	0.084	0.676
3	0.114	0.115	0.157	0.141	0.134	0.116	0.143	0.154	8	0.172	0.098	0.265
4	0.323	0.195	0.357	0.238	0.487	0.408	0.326	0.366	10	0.397	0.195	0.676
5	0.532	0.264	0.286	0.286	0.267	0.275	0.228	0.293	4	0.361	0.182	0.572
6	0.527	0.331	0.409	0.349	0.291	0.297	0.276	0.366	4	0.373	0.187	0.553
7	0.433	0.266	0.445	0.311	0.372	0.328	0.307	0.379	9	0.396	0.253	0.542
8	0.383	0.234	0.256	0.235	0.217	0.168	0.189	0.256	3	0.286	0.158	0.445
9	0.571	0.317	0.359	0.362	0.360	0.318	0.313	0.374	5	0.422	0.235	0.575
10	0.327	0.198	0.448	0.283	0.408	0.376	0.341	0.415	4	0.347	0.198	0.578
11	0.492	0.275	0.378	0.313	0.287	0.328	0.302	0.393	-	0.345	0.112	0.492
12	0.492	0.285	0.371	0.314	0.347	0.318	0.269	0.344	2	0.351	0.139	0.512
13	0.512	0.346	0.469	0.366	0.371	0.353	0.342	0.452	5	0.395	0.124	0.575
14	0.517	0.232	0.311	0.248	0.246	0.270	0.236	0.289	7	0.323	0.098	0.517
15	1	0.346	0.383	0.371	0.305	0.338	0.282	0.401	4	0.381	0.107	0.571
16	0.346	1	0.377	0.337	0.246	0.268	0.258	0.356	5	0.253	-0.007	0.377
17	0.383	0.377	1	0.431	0.419	0.506	0.469	0.614	5	0.364	0.067	0.614
18	0.371	0.337	0.431	1	0.311	0.303	0.300	0.407	4	0.287	0.014	0.431
19	0.305	0.246	0.419	0.311	1	0.394	0.351	0.412	3	0.312	0.134	0.487
20	0.338	0.268	0.506	0.303	0.394	1	0.694	0.663	2	0.333	0.096	0.694
21	0.282	0.258	0.469	0.300	0.351	0.694	1	0.690	2	0.310	0.064	0.694
22	0.401	0.356	0.614	0.407	0.412	0.663	0.690	1	1	0.372	0.047	0.690

Technical Adequacy of Tasks and Items  
Page 17

*Table 3d: Math Differential Item Functioning by Grade Level*

Task	# of Items	Items with Significant Difference Across Grade Levels (sign indicates sign of <i>t</i> -score)		
		Elementary-Middle	Elementary-High	Middle-High
1	8		-1	
2	8			
3	8			
4	10	-1, -4	-1, -4, 8, -10	8, -10
5	4		3	3
6	4			
7	9	1, 3, 4, 5, -9	3, 4, -9	5
8	3			
9	5		-4	
10	4		-1, -2	-2
11	1			
12	2			
13	5	4		
14	7			
15	4	-1, 4	-2, 4	
16	5			
17	5		-2	
18	4	-2, 3	-2	
19	3			

Technical Adequacy of Tasks and Items  
Page 18

*Table 3e: Math Task Descriptive Statistics by Grade Level*

Task	Elementary			Jr. High			High School		
	Mean	SD	<i>n</i>	Mean	SD	<i>n</i>	Mean	SD	<i>n</i>
1	7.894	0.581	1513	7.850	0.827	695	7.916	0.635	203
2	22.882	3.739	1475	22.857	3.713	680	22.660	3.946	194
3	5.971	1.798	1457	5.974	1.856	684	5.579	1.758	197
4	39.289	9.445	1455	40.340	8.923	668	41.096	7.209	197
5	3.311	1.054	1515	3.177	1.150	696	3.302	1.103	202
6	2.533	1.180	1515	2.486	1.236	696	2.541	1.250	196
7	7.754	2.559	1472	8.361	2.233	684	8.714	1.816	199
8	2.348	0.850	1510	2.385	0.833	696	2.408	0.789	201
9	3.813	1.407	1494	3.790	1.453	687	3.990	1.319	201
10	8.831	3.143	1442	9.832	3.022	662	10.170	2.309	194
11	0.750	0.433	1457	0.740	0.439	672	0.749	0.435	199
12	1.5114	0.750	1447	1.445	0.776	672	1.472	0.764	199
13	2.683	1.588	1414	3.115	1.579	655	3.451	1.517	195
14	6.401	1.062	1424	6.355	1.153	654	6.327	1.162	196
15	3.191	1.106	1436	3.101	1.199	656	3.102	1.116	197
16	1.863	0.956	1275	2.073	1.079	603	1.989	1.025	182
17	4.433	3.221	1273	5.248	3.333	597	5.099	3.289	182
18	2.177	1.271	1288	2.288	1.297	600	2.234	1.272	175
19	18.701	4.284	1306	18.755	4.281	603	18.522	4.413	184
20	22.780	9.816	1279	23.195	10.011	591	22.638	10.811	177
21	11.794	6.939	1258	12.260	6.392	585	11.531	7.522	175
22	9.167	5.250	1193	9.775	5.514	572	9.637	5.741	171

Technical Adequacy of Tasks and Items  
Page 19

*Table 4a: Science SPSS Item Analysis Summary by Task*

Task	# of Items	Inter-Item Correlations			Alpha Coefficient
		Mean	Minimum	Maximum	
1	5	.222	.131	.264	.564
2	5	.502	.444	.616	.830
3	5	.149	.046	.292	.480
4	5	.291	.152	.396	.660
5	5	.516	.426	.628	.836
6	5	.278	.196	.454	.649
7	5	.317	.236	.460	.684
8	5	.401	.333	.578	.766
9	5	.243	.104	.404	.607
10	5	.267	.151	.564	.628
11	5	.221	.085	.342	.566

Technical Adequacy of Tasks and Items  
Page 20

*Table 4b: Science IRT and IPL Item Analysis Summary by Task*

Task	# of items	Item Fit Statistics			Person Fit Statistics			
		Mean	Min.	Max.	Reliability	Mean	Min.	Max.
1	5	.96	.77	1.12	.85	.97	.25	5.11
2	5	.99	.75	1.30	.92	.99	.14	3.61
3	5	1.06	.95	1.24	.86	1.06	.25	8.77
4	5	.97	.81	1.19	.88	.97	.28	4.97
5	5	.97	.08	3.40	.91	.97	.84	1.19
6	5	.97	.75	1.06	.90	.97	.30	3.41
7	5	1.00	.85	1.33	.89	1.00	.25	5.81
8	5	.99	.77	1.27	.91	.99	.48	2.35
9	5	1.13	.86	1.43	.87	1.13	.23	9.69
10	5	1.01	.67	1.64	.88	.98	.11	9.90
11	5	1.03	.75	1.32	.89	1.03	.27	8.60

Technical Adequacy of Tasks and Items  
Page 21

*Table 4c: Science Task Correlations and Average Correlation and Correlation Range by Task*

Task	1	2	3	4	5	6	7	8	9	10	11	# of items	Mean Cor.	Min. Cor.	Max. Cor.
1	1	0.511	0.461	0.463	0.539	0.447	0.414	0.462	0.335	0.359	0.373	5	0.436	0.335	0.539
2	0.511	1	0.484	0.495	0.498	0.567	0.540	0.522	0.427	0.454	0.385	5	0.488	0.385	0.567
3	0.461	0.484	1	0.436	0.487	0.454	0.415	0.408	0.376	0.382	0.375	5	0.428	0.375	0.487
4	0.463	0.495	0.436	1	0.565	0.452	0.507	0.554	0.464	0.414	0.346	5	0.470	0.346	0.565
5	0.539	0.498	0.487	0.565	1	0.494	0.537	0.645	0.468	0.460	0.456	5	0.515	0.456	0.645
6	0.447	0.567	0.454	0.452	0.494	1	0.515	0.470	0.417	0.410	0.367	5	0.459	0.367	0.567
7	0.414	0.540	0.415	0.507	0.537	0.515	1	0.546	0.479	0.438	0.434	5	0.430	0.414	0.546
8	0.462	0.522	0.408	0.554	0.645	0.470	0.546	1	0.566	0.451	0.451	5	0.508	0.408	0.645
9	0.335	0.427	0.376	0.464	0.468	0.417	0.479	0.566	1	0.427	0.397	5	0.436	0.335	0.566
10	0.359	0.454	0.382	0.414	0.460	0.410	0.438	0.451	0.427	1	0.421	5	0.422	0.359	0.460
11	0.373	0.385	0.375	0.346	0.456	0.367	0.434	0.451	0.397	0.421	1	5	0.401	0.346	0.456

Technical Adequacy of Tasks and Items  
Page 22

Table 4d: Science Differential Item Functioning by Grade Level

Task	# of Items	Items with Significant Difference Across Grade Levels (sign indicates sign of <i>t</i> -score)		
		Elementary-Middle	Elementary-High	Middle-High
1	5			
2	5			
3	5	5		3
4	5	-4		
5	5	1	1	
6	5	1, -4		
7	5			
8	5			
9	5			
10	5	-2		
11	5	5		

Technical Adequacy of Tasks and Items  
Page 23

*Table 4e: Science Task Descriptive Statistics by Grade Level*

Task	Elementary			Jr. High			High School		
	Mean	SD	<i>n</i>	Mean	SD	<i>n</i>	Mean	SD	<i>n</i>
1	4.486	0.852	321	4.528	0.928	286	4.468	0.901	126
2	8.241	2.578	316	8.272	2.694	283	8.151	2.533	126
3	3.997	1.111	318	4.121	1.047	282	4.080	1.052	125
4	4.361	1.114	316	4.404	0.998	282	4.484	0.956	128
5	8.527	2.045	324	8.751	2.020	285	8.606	1.809	127
6	3.39	1.460	314	3.561	1.463	280	3.585	1.390	123
7	4.149	1.232	316	4.218	1.224	280	4.250	1.031	120
8	4.054	1.378	315	4.101	1.418	278	4.081	1.353	124
9	3.681	1.240	313	3.792	1.357	279	3.769	1.257	121
10	3.658	1.263	319	3.727	1.359	278	3.777	1.255	121
11	3.574	1.240	312	3.836	1.274	281	3.672	1.301	122