

2010 Erasure Analysis Report
New Jersey Assessment of Skills and Knowledge (NJ ASK 3-8)
Draft

November 2010

Introduction

This report summarizes erasures analyses results for the 2010 administration of the NJ ASK for grades 3 through 8. Two approaches are considered to investigate irregularities in response patterns: 1) erasure rates based on student Wrong to Right (WTR) erasures, and 2) grade/subject level person-fit rates for each school based on student response patterns. The person-fit analysis is introduced this year per recommendation from NJ ASK Technical Advisory Committee meeting.

This report is divided into two parts. In Part 1, aggregate erasure rates are analyzed using both operational and field-test data. The analysis is further extended to grade, grade/subject, and district factor group (DFG) level.

In Part 2, the schools flagged for high erasure rates by grade and subject area for the operational tests are compared against the person-fit rates. A flag of the same school for a high erasure rate and a poor person-fit rate may be an indication of irregularities in the test administration.

Part 1. Erasures Analysis

Aggregate Erasures for Grade, Subject, Subject/Grade, and DFG

In this section, a summary of the total number of erasures and percentage of total erasures by erasure types across grades are presented first followed by the total erasures across subject areas in the NJ ASK tests. The total erasures by erasure type are then broken down into grades and subject areas and district factor groups (DFG). These aggregate erasures are presented with 2009 results side-by-side for comparison purpose. Finally, erasure rates by school (for all grades and subject areas) and by grade across subject areas are presented.

The erasure analysis for NJ ASK grades 3 through 8 showed a total of 2,531,290 erasures. Quality control checks and verification procedures were implemented to ensure that reported erasures are valid. The percentage of WTR erasures and the mean number of erasures per student were two critical pieces of information for the erasure analysis. The percentage of WTR erasures were calculated by dividing the number of erasures that changed an incorrect response to a correct response by the total number of erasures. These calculations were aggregated by schools at the grade, subject, subject/grade, and DFG levels.

Of the 2,531,290 total erasures, 58.52% involved changing an incorrect response to a correct response. Table 1 shows the total erasures and percentage of each type of erasures by grade. A comparison of the erasure results between 2009 and 2010 (Table 1) indicates that 430,374 more erasures occurred in 2010 than in 2009 across the grades and subject areas, a 20.5% increase. The total numbers of erasures increased in grades 3, 4, 7, and 8 and decreased in grades 5 and 6 for 2010 from 2009. The percentages of erasures types, however, have remained fairly similar across the two administrations with a slight

increase of WTR and a decrease of Wrong to Wrong (WTW) across all grades. Table 2 shows the total erasures and percentage of each change by subject area for 2009 and 2010, respectively. As was the case in 2009, a slightly higher percentage of WTR erasures occurred in LAL followed by mathematics, and science.

Table 1: Erasures by Grade

Grade	2009				2010			
	Total Erasures	% Wrong To Right	% Right To Wrong	% Wrong To Wrong	Total Erasures	% Wrong To Right	% Right To Wrong	% Wrong To Wrong
3	156065	60.62	15.25	24.17	293528	63.73	14.04	22.23
4	308042	55.03	19.41	25.6	519997	56.48	19.25	24.28
5	358987	58.45	15.61	26.01	319892	60.19	16.25	23.56
6	377861	59.88	15.86	24.33	340150	60.85	15.16	23.99
7	286469	56.68	16.18	27.2	356386	58.18	16.66	25.16
8	613492	54.15	18.7	27.2	701337	56.14	18.53	25.33
Total	2,100,916	56.87	17.17	26.02	2,531,290	58.52	17.15	24.32

Table 2: Erasures by Subject Area

Subject	2009				2010			
	Total Erasures	% Wrong To Right	% Right To Wrong	% Wrong To Wrong	Total Erasures	% Wrong To Right	% Right To Wrong	% Wrong To Wrong
LAL	858286	58.68	17.16	24.23	859387	60.68	16.60	22.71
Math	886349	57.99	15.31	26.75	1173951	60.32	14.85	24.83
Science	356281	49.73	21.8	28.52	497952	50.55	23.54	25.91
Total	2,100,916	56.87	17.17	26.02	2,531,290	58.52	17.15	24.32

Table 3 shows the erasure types by subject area and grade. The total numbers of erasures increased from 2009 to 2010 across most grades and subject areas except for grades 5, 6, and 8 LAL. Of the total erasures, the highest percentage of WTR erasures in LAL occurred in grade 8 (63.17%). For math, the highest percentage of the WTR erasures occurred in grade 3 (66.99%) and for science in grade 8 (51.38%).

Table 3: Erasures by Subject/Grade

Subject	Grade	2009				2010			
		Total Erasures	% Wrong To Right	% Right To Wrong	% Wrong To Wrong	Total Erasures	% Wrong To Right	% Right To Wrong	% Wrong To Wrong
LAL	3	49086	53.52	18.58	27.94	88270	56.15	18.25	25.60
	4	60244	52.30	21.58	26.18	106551	57.91	17.28	24.81
	5	170450	58.62	16.64	24.83	123899	61.70	17.17	21.13
	6	204605	62.70	15.61	21.77	154093	62.61	15.42	21.97
	7	153244	57.51	16.78	25.75	186654	59.47	16.91	23.61
	8	220657	58.7	17.74	23.64	199920	63.17	15.79	21.04
Math	3	106979	63.88	13.72	22.44	205258	66.99	12.23	20.77
	4	122284	61.17	14.01	24.87	210244	62.64	14.13	23.23
	5	188537	58.30	14.67	27.08	195993	59.24	15.67	25.09
	6	173256	56.55	16.16	27.35	186057	59.39	14.95	25.66
	7	133225	55.72	15.48	28.87	169732	56.75	16.39	26.85
	8	162068	54.76	17.04	28.25	206667	56.13	16.04	27.84
Science	4	125514	50.36	23.64	26.04	203202	49.34	25.57	25.09
	8	230767	49.38	20.79	29.87	294750	51.38	22.14	26.48
Total		2,100,916	56.87	17.17	26.02	2,531,290	58.52	17.15	24.32

Table 4 shows the total erasures and percentage of each type of erasure by DFG. The percentages of WTR erasures by DFG in 2010 are quite similar to the 2009 pattern with the highest percentage of WTR erasures from DFG “J” followed by “I” and “GH”.

Table 4: Erasures by DFG

DFG	2009				2010			
	Total Erasures	% Wrong To Right	% Right To Wrong	% Wrong to Wrong	Total Erasures	% Wrong To Right	% Right To Wrong	% Wrong to Wrong
J	83053	66.02	15.2	18.82	102822	67.21	15.63	17.15
I	355954	62.60	16.13	21.31	448313	63.97	16.34	19.69
GH	269570	59.98	16.47	23.6	320350	60.81	16.99	22.20
FG	257964	58.31	16.81	24.95	299189	59.83	17.00	23.17
V	153	60.13	15.69	24.18	198	59.09	20.20	20.71
DE	265345	57.23	17.06	25.77	321475	59.09	16.92	23.99
CD	204618	54.84	17.78	27.45	239459	56.05	17.85	26.10
B	216150	53.39	17.79	28.88	261287	54.80	17.79	27.40
R	36526	53.82	17.67	28.5	47473	54.37	17.13	28.50
A	402180	50.04	18.52	31.51	479822	52.71	17.86	29.43
N	9837	49.90	18.67	31.52	10089	50.95	18.61	30.44
O	836	39.16	21.44	39.52	813	35.79	23.86	40.34
Total	2,100,916	56.87	17.17	26.02	2,531,290	58.52	17.15	24.32

Aggregate School Erasure Rates

The state mean WTR erasure rate per student was derived by dividing the total number of WTR erasures by the total number of students in the state. Similarly, a school’s WTR erasure rate was derived by dividing the total number of erasures by the total number of students in the school, irrespective of grade and subject area. Table 5 displays the average number of WTR erasures per student for schools with erasure rates above or below two standard deviations of the state mean. The statewide WTR erasure rate per student for schools with more than 30 students was 2.43 with a standard deviation of 0.75. Erasure rates two standard deviations above the state mean indicate higher than expected erasures; whereas erasure rates two standard deviations below the state mean imply fewer erasures than might be expected.

Please note: The selection of two standard deviations was somewhat arbitrary and not intended to indicate that the WTR rate at these schools was statistically different from the statewide mean WTR rate. The primary purpose of these analyses was simply a screening device to identify schools with more than or less than the expected number of WTR erasures. The expectation was that additional investigations would be implemented at schools with excessive WTR erasures as

defined by the NJ DOE. These analyses were not designed to conclude that inappropriate activities had or had not occurred.

A comparison of Table 5 with 2009 results reveals that some schools that were flagged for high erasure rates measured by the mean WTR erasures per student in 2009 were also flagged for high erasure rates in 2010. For example, ABINGTON AVE in Table 5 had the highest erasure rate (mean erasures=11.70) in 2010 and was also flagged for a high erasure rate in 2009 (mean erasures=6.79).

Table 5: Mean Student Erasure Rate by School, 2010

School Code	School Name	No. of Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures/Student
133570170	Abington Ave	459	5369	11.70
133570630	Roseville Avenue E.S.	64	674	10.53
133570575	Rafael Hernandez School	566	5273	9.32
34380060	Grant	115	935	8.13
131210093	Fourth Avenue School	140	1075	7.68
133570430	Franklin E.S.	151	888	5.88
31580015	Franklin Ave Middle Sch	373	2132	5.72
391320230	No 20 John Marshall	211	1190	5.64
235850100	Avenel Street	237	1310	5.53
235850140	Ford Avenue	146	790	5.41
172210063	Calabro	99	530	5.35
133570180	Alexander St	480	2439	5.08
34380080	Roosevelt	235	1192	5.07
311920015	Haledon Public Sch	669	3389	5.07
394550060	Ernest J Finizio-Aldene	129	640	4.96
175240090	Hudson	201	977	4.86
130410080	Carteret	235	1132	4.82
133570420	Fourteenth Avenue E.S.	69	329	4.77
133570580	Newton St	212	1002	4.73
131210110	Dionne Warwick Institute	201	947	4.71
133570530	Miller St	269	1258	4.68
30890070	Number 5	99	458	4.63
133880110	Oakwood Ave	117	539	4.61
170220085	Midtown Community Sch #8	717	3297	4.60
391320180	No 15 C Columbus	276	1266	4.59
131210080	Langston Hughes School	217	991	4.57
110950025	Haleyville-Mauricetown	196	891	4.55
274000030	Central	379	1705	4.50

School Code	School Name	No. of Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures/Student
175240118	Veteran's Memorial School	237	1051	4.43
807503970	Paterson Cs For Science And Te	250	1104	4.42
10590055	John C. Milanesi Elem Sch	193	843	4.37
235850210	Lynn Crest	126	548	4.35
235850280	Ross Street	251	1087	4.33
294210060	Ocean Road Elem	258	1110	4.30
33600060	Jefferson	161	687	4.27
10110050	Chelsea Heights	293	1242	4.24
133570350	Cleveland	213	900	4.23
35410050	Julia A Traphagen	181	762	4.21
55805080	W.R. James Sr. E.S.	129	542	4.20
295190065	Cedar Grove Elem	377	1577	4.18
35830070	Greta Ostrovsky Middle	248	1036	4.18
14180060	Washington Avenue Elem.	120	500	4.17
133880060	Central	132	550	4.17
53440060	T.E. Harrington Middle	1020	4242	4.16
131210050	Edward T. Bowser Sr.	328	1348	4.11
172210065	Connors	229	941	4.11
211950150	Kisthardt	125	511	4.09
391320150	No 12 Elmora	335	1364	4.07
133880070	Cleveland St	148	600	4.05
31700080	Lincoln School #6	164	661	4.03
807730970	Robert Treat Academy Cs	298	1197	4.02
172390130	Kennedy Number 9	86	343	3.99
110540130	West Ave	458	1825	3.98
393560080	New Providence Middle Sch	254	998	3.93
252105060	Beers St School	262	215	0.82

Schools Erasure Rates by Grade

Table 6 shows the mean and standard deviation (SD) for the statewide WTR erasure rate per student by grade level. Tables 7 through 12 show the average number of WTR erasures per student by school at the respective grade level, irrespective of subject area. Only schools with WTR erasure rates greater than two standard deviations above or below the statewide grade level mean are displayed in the Tables. The schools with fewer than 30 examinees are excluded from all analysis and reporting.

Table 6: Descriptive Statistics for Schools by Grade Level

Grade	Mean WTR Erasure Rate	Standard Deviation	2 SD Above Mean	2 SD Below Mean
3	1.85	0.88	3.60	0.10
4	2.89	1.12	5.13	0.65
5	1.89	0.79	3.46	0.31
6	2.03	1.05	4.13	-0.06
7	2.03	0.67	3.37	0.68
8	3.88	1.29	6.46	1.31
All	2.43	0.75	3.92	0.94

Table 7: Grade 3 - Mean Student Erasure Rate by School

School Code	School Name	No. of Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student
133570630	Roseville Avenue E.S.	39	382	9.79
391320230	No 20 John Marshall	49	441	9.00
133570575	Rafael Hernandez School	36	289	8.03
391320180	No 15 C Columbus	60	464	7.73
131210093	Fourth Avenue School	55	405	7.36
235850100	Avenel Street	87	610	7.01
110950025	Haleyville-Mauricetown	64	444	6.94
133570180	Alexander St	95	644	6.78
133570430	Franklin E.S.	81	534	6.59
133570580	Newton St	35	225	6.43
130410080	Carteret	60	385	6.42
235850280	Ross Street	95	552	5.81
175240120	Washington	79	458	5.80
806910940	Jersey City Community Cs	71	397	5.59
133570170	Abington Ave	85	475	5.59
131210130	Gordon Parks Academy	45	242	5.38
133570250	Bragaw Ave	48	250	5.21
394550060	Ernest J Finizio-Aldene	45	234	5.20
211950150	Kisthardt	37	187	5.05
110540100	Quarter Mile Lane	49	246	5.02
172210065	Connors	46	226	4.91
175240118	Veteran's Memorial School	75	357	4.76
172390120	Number 8	95	451	4.75
391320260	No 23 N M Butler	77	349	4.53
391320200	No 17 T Roosevelt	50	224	4.48
133570300	Burnet St	42	186	4.43
175240090	Hudson	70	309	4.41

School Code	School Name	No. of Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student
391320035	No 4 John Battin Es	71	313	4.41
311920015	Haledon Public Sch	104	456	4.38
54050085	Howard L. Emmons E.S.	52	225	4.33
133570460	Hawkins St	67	286	4.27
235850210	Lynn Crest	49	205	4.18
235850140	Ford Avenue	58	241	4.16
10110070	New York Avenue School	54	221	4.09
131210050	Edward T. Bowser Sr.	119	486	4.08
10110050	Chelsea Heights	42	171	4.07
31700080	Lincoln School #6	48	194	4.04
391320120	No 6 Toussaint Louverture-Marq	78	311	3.99
133570435	George Washington Carver	65	256	3.94
34470050	Midland #1	43	169	3.93
394290090	Grover Cleveland	48	185	3.85
133570610	Ridge St	61	234	3.84
131210080	Langston Hughes School	73	280	3.84
14180060	Washington Avenue Elem.	50	191	3.82
133570200	Ann St	150	573	3.82
10590055	John C. Milanesi Elem Sch	50	190	3.80
133570530	Miller St	49	186	3.80
30300050	Hoover	42	159	3.79
314010315	Roberto Clemente E.S.	87	326	3.75
295190070	East Dover Elem	116	433	3.73
132330120	Madison Ave	67	245	3.66
34610090	Long Memorial	44	159	3.61
54050140	Joseph S. Stackhouse E.S.	54	195	3.61
215210220	Harrison	54	195	3.61
175240130	Robert Waters	143	516	3.61

Table 8: Grade 4 - Mean Student Erasure Rate by School

School Code	School Name	No. of Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student
110540130	West Ave	82	1053	12.84
34380060	Grant	31	372	12.00
30890080	Number 6	48	509	10.60
133570170	Abington Ave	70	707	10.10
10110050	Chelsea Heights	35	351	10.03
133570180	Alexander St	88	856	9.73
33600060	Jefferson	49	450	9.18

School Code	School Name	No. of Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student
131210093	Fourth Avenue School	37	319	8.62
131210110	Dionne Warwick Institute	68	565	8.31
10110080	Uptown School Complex	72	573	7.96
34380080	Roosevelt	62	482	7.77
130410060	Brookdale	43	333	7.74
133570530	Miller St	39	280	7.18
35410050	Julia A Traphagen	74	524	7.08
133880070	Cleveland St	40	283	7.08
806910940	Jersey City Community Cs	68	466	6.85
133570420	Fourteenth Avenue E.S.	32	219	6.84
151330010	Aura	45	298	6.62
808065980	University Heights Cs	38	250	6.58
175240118	Veteran's Memorial School	82	534	6.51
806665930	Gray Cs	36	234	6.50
391320150	No 12 Elmora	71	454	6.39
55805080	W.R. James Sr. E.S.	72	450	6.25
135680130	Hazel Ave	58	362	6.24
133570300	Burnet St	42	255	6.07
32740065	Hilltop	48	290	6.04
295190065	Cedar Grove Elem	142	856	6.03
175240090	Hudson	65	385	5.92
133570350	Cleveland	34	201	5.91
133570710	Sussex Ave	39	229	5.87
30890050	Number 3	41	240	5.85
133570200	Ann St	139	812	5.84
172210065	Connors	45	258	5.73
130410080	Carteret	45	255	5.67
290320040	H & M Potter E.S.	87	493	5.67
53440010	Countryside E.S.	59	331	5.61
172390260	Gladys Nunnery	65	360	5.54
175240140	Woodrow Wilson	38	210	5.53
31130070	Lincoln	37	204	5.51
175240120	Washington	81	446	5.51
10590045	Collings Lake Elem Sch	36	198	5.50
10590055	John C. Milanesi Elem Sch	74	402	5.43
314010050	Number 1	32	172	5.38
131210090	Whitney E. Houston Acad	60	322	5.37
133570590	Oliver St	80	423	5.29
211950150	Kisthardt	35	185	5.29
133880060	Central	32	167	5.22

Table 9: Grade 5 - Mean Student Erasure Rate by School

School Code	School Name	No. of Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student
133570575	Rafael Hernandez School	128	1165	9.10
235850140	Ford Avenue	41	312	7.61
133570170	Abington Ave	65	493	7.58
131210093	Fourth Avenue School	48	351	7.31
807290957	New Horizons Community Cs	38	232	6.11
131210090	Whitney E. Houston Acad	67	395	5.90
130410080	Carteret	61	335	5.49
133880060	Central	39	212	5.44
311920015	Haledon Public Sch	106	555	5.24
211950110	Greenwood	44	221	5.02
131210080	Langston Hughes School	72	356	4.94
394550060	Ernest J Finizio-Aldene	46	221	4.80
133570350	Cleveland	35	168	4.80
34380080	Roosevelt	65	304	4.68
235850100	Avenel Street	65	301	4.63
32860110	Roosevelt	32	146	4.56
211245060	Grace Norton Rogers Sch	70	313	4.47
294210060	Ocean Road Elem	86	374	4.35
175240090	Hudson	66	283	4.29
31700080	Lincoln School #6	52	220	4.23
133570580	Newton St	42	177	4.21
391320180	No 15 C Columbus	44	178	4.05
172390260	Gladys Nunnery	50	200	4.00
151330010	Aura	48	187	3.90
235850210	Lynn Crest	39	149	3.82
391320230	No 20 John Marshall	36	136	3.78
31450140	Warren Point	75	280	3.73
214255090	Riverside	37	138	3.73
391320200	No 17 T Roosevelt	48	178	3.71
30300040	Franklin	75	276	3.68
235850275	Port Reading	80	293	3.66
391320090	No 1 G Washington	91	332	3.65
10590055	John C. Milanesi Elem Sch	69	251	3.64
14180060	Washington Avenue Elem.	33	120	3.64
10590045	Collings Lake Elem Sch	38	136	3.58
113230085	Rieck Ave	71	254	3.58
133570200	Ann St	136	484	3.56
32090050	Haworth	55	193	3.51
133570610	Ridge St	63	221	3.51

Table 10: Grade 6 - Mean Student Erasure Rate by School

School Code	School Name	No. of Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student
31580015	Franklin Ave Middle Sch	36	754	20.94
133570575	Rafael Hernandez School	137	1384	10.10
133570170	Abington Ave	69	635	9.20
807730970	Robert Treat Academy Cs	50	375	7.50
34380060	Grant	36	269	7.47
133880110	Oakwood Ave	32	212	6.63
133570350	Cleveland	34	163	4.79
170220085	Midtown Community Sch #8	117	530	4.53
133570580	Newton St	30	132	4.40
34380080	Roosevelt	53	222	4.19

Table 11: Grade 7 - Mean Student Erasure Rate by School

School Code	School Name	No. of Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student
133570170	Abington Ave	68	663	9.75
133570575	Rafael Hernandez School	126	937	7.44
311920015	Haledon Public Sch	117	703	6.01
807503970	Paterson Cs For Science And Te	83	377	4.54
110540055	Cherry Street	51	211	4.14
170220085	Midtown Community Sch #8	125	479	3.83
35830070	Greta Ostrovsky Middle	97	363	3.74
334280050	Quinton Twp	32	118	3.69
70880010	Clementon Elem	62	228	3.68
32090050	Haworth	61	217	3.56
807600960	Queen City Academy Cs	35	120	3.43
133570300	Burnet St	33	113	3.42
133570530	Miller St	38	128	3.37
391320100	No 2 Winfield Scott	38	25	0.66

Table 12: Grade 8 - Mean Student Erasure Rate by School

School Code	School Name	No. of Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student
133570170	Abington Ave	102	2396	23.49
133570575	Rafael Hernandez School	110	1237	11.25
170220085	Midtown Community Sch #8	123	1166	9.48
393560080	New Providence Middle Sch	95	706	7.43
311920015	Haledon Public Sch	114	815	7.15
133570530	Miller St	53	371	7.00
390310030	Columbia	160	1108	6.93
274000030	Central	135	926	6.86
292500050	Lakehurst Elem	42	286	6.81
271530030	Ridgedale	109	725	6.65

The following observations can be made from the Tables in Part 1:

1. Overall, about 20.5% more erasures occurred in 2010 compared to 2009. Despite the increase of total erasures, the percentages of different types of erasures were very similar across grades, subject areas, and DFGs between the two administrations.
2. At aggregate level (Table 5), 17 schools that were flagged for high erasure rates in 2010 were also flagged in 2009. Nine of the 17 schools were also flagged for high erasure rates in one or more grades in 2010 (Tables 7-12).
3. The school Abington Ave was flagged for a high erasure rate at the aggregate level (Table 5) as well as at all grade levels (Table 7-12) in 2010.

Part 2. School Erasures and Person-Fit Analyses by Grade and Subject

Part 2 provides WTR erasure rates per student on operational tests by grade and subject area (LAL, mathematics, and science) for schools with 30 or more examinees and compares the schools with high erasure rates against person-fit measures. The mean number of WTR erasures per student in a given grade for a given subject area was calculated by dividing the total number of WTR erasures by the total number of students in the given grade for the subject area. The schools that were flagged for high WTR erasure rates in a given grade/subject area were then compared against the schools that were flagged for poor person-fit rates. If the two approaches flagged the same schools it may be an indication of test irregularity.

The person-fit analysis is an item response theory (IRT) based approach where the unexpected behaviors of a student can be detected given his/her ability. The four measures that were employed here included InFit, OutFit, Standardized InFit, and Standardized OutFit. The InFit measures unexpected behavior affecting responses to items targeted to the student's ability level, OutFit measures unexpected behavior of a student on items far from the person's ability level; and standardized InFit and OutFit detects the statistical probability of the mean-square statistics occurring by chance when the data fit the Rasch model (Linacre, 2006). For example, if an average student were to answer an average difficulty item incorrectly the associated InFit statistic would likely be outside of the targeted range described below; whereas, if the same average student answered extremely difficult item correctly the accompanying OutFit statistics would again be outside of the expected range.

A student's response pattern was flagged for abnormality if the InFit and OutFit values were outside the range of .7 and 1.3. It is expected that the InFit and OutFit values are close to 1.0. The values greater than 1.0 show poor model fit indicating variance in the data not explained by the model. Whereas, the values less than 1.0 show overfit indicating that the model predicts the data too well causing inflated statistics. Since the standardized InFit (ZIn) and OutFit (ZOut) values follow normal distribution the 95% confidence interval ($\pm 1.96 \sim \pm 2.0$) was used to flag a student with abnormal response pattern. The negative standardized values indicate overfit. For a more detailed explanation about the statistics readers are advised to refer to WINSTEPS User's Guide (Linacre, 2006).

The person fit rates for InFit, OutFit, ZInFit, and ZOutFit for each grade and subject area of a school were derived separately by dividing total number of students flagged from each of the criterion above by the total number of students in the given grade and subject area of a school.

Table 13 provides the mean, standard deviation, and values for two standard deviations above and below the mean WTR erasure rates for the operational tests in statewide LAL grades. The WTR erasure rates per student were derived using the same procedure described in Part 1, except in this case only erasures on the operational items were analyzed.

Table 13: Descriptive Statistics by Grade Level in Lang. Arts Literacy – Operational Only

Grade	Mean WTR Erasure Rate	Standard Deviation	2 SD Above Mean	2 SD Below Mean
3	0.40	0.29	0.97	-0.17
4	0.49	0.31	1.11	-0.12
5	0.66	0.33	1.32	0.00
6	0.86	0.47	1.80	-0.09
7	0.98	0.32	1.62	0.34
8	1.13	0.45	2.03	0.22

Tables 14-19 provide list of schools flagged for WTR erasure rates per student from the two standard deviation criteria and the associated poor person-fit flags for the schools. A “1” in the InFit, OutFit, ZIn, or ZOut columns indicates that the school was flagged for a poor-fit rate two standard deviation or above the state mean for the measures. For example, the first school in Table 14 (Franklin E.S.) was flagged for a high erasure rate on the grade 3 operational LAL test; however, it was not flagged for poor person-fit rate from any of the measures.

Similarly, Table 20 provides means, standard deviations, and values for two standard deviations above and below the statewide mean WTR erasure rate for the operational tests in mathematics. Tables 21-26 provide lists of schools flagged from the two standard deviation criteria and the associated poor person-fit flag for the school. Finally, Table 27 provides the statewide means, standard deviations, and values for two standard deviations above and below the statewide mean WTR erasure rate for the operational tests in science and Tables 28-29 provide lists of schools flagged from the two standard deviation criteria and the associated poor person-fit flag for the school.

Table 14: Grade 3 - Mean Student WTR Erasure Rate for LAL by School – Operational Only with Infit and Outfit Flags

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
133570430	Franklin E.S.	81	260	3.21				
133570630	Roseville Avenue E.S.	39	101	2.59				
133570180	Alexander St	95	231	2.43				
133570575	Rafael Hernandez School	36	84	2.33				
110950025	Haleyville-Mauricetown	64	143	2.23			1	1
391320230	No 20 John Marshall	49	97	1.98				
235850100	Avenel Street	87	172	1.98	1			
131210093	Fourth Avenue School	55	106	1.93				
391320180	No 15 C Columbus	60	114	1.90				
133570580	Newton St	35	63	1.80				
133570460	Hawkins St	67	115	1.72				
10590055	John C. Milanese Elem Sch	50	84	1.68				
235850280	Ross Street	95	152	1.60				
392660090	Number 2	39	62	1.59				
175240120	Washington	79	125	1.58				
110540100	Quarter Mile Lane	49	76	1.55				
172390120	Number 8	95	143	1.51				
133570170	Abington Ave	85	127	1.49				
394550060	Ernest J Finizio-Aldene	45	67	1.49				
133880060	Central	30	44	1.47		1		
131210130	Gordon Parks Academy	45	66	1.47				
130410080	Carteret	60	86	1.43				
133570250	Bragaw Ave	48	68	1.42				

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
215210220	Harrison	54	74	1.37				1
175240118	Veteran's Memorial School	75	101	1.35				
311920015	Haledon Public Sch	104	137	1.32				
175240090	Hudson	70	91	1.30				
133570200	Ann St	150	189	1.26				
235850210	Lynn Crest	49	61	1.24				
391320200	No 17 T Roosevelt	50	61	1.22				
133570300	Burnet St	42	51	1.21				
335910060	Mary S Shoemaker	82	98	1.20				
131210050	Edward T. Bowser Sr.	119	142	1.19				
133570530	Miller St	49	57	1.16		1		
54050085	Howard L. Emmons E.S.	52	60	1.15				
314010315	Roberto Clemente E.S.	87	100	1.15				
31860090	Nellie K. Parker E.S.	76	86	1.13				
172210065	Connors	46	52	1.13				
391320120	No 6 Toussaint Louverture-Marq	78	88	1.13				
132330120	Madison Ave	67	75	1.12				
294210060	Ocean Road Elem	69	77	1.12				
373840050	Ogdensburg	39	43	1.10				
314010220	Number 18	111	121	1.09		1		
133570610	Ridge St	61	66	1.08				
391320260	No 23 N M Butler	77	83	1.08				
132330090	Chancellor Ave	68	73	1.07				
34380080	Roosevelt	55	59	1.07				

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
10110050	Chelsea Heights	42	45	1.07				
131210090	Whitney E. Houston Acad	71	75	1.06				
131210190	Johnnie L Cochran Jr Acad	44	46	1.05				
34380070	Lincoln Elem School	45	47	1.04				
133570435	George Washington Carver	65	67	1.03				
806910940	Jersey City Community Cs	71	73	1.03				
130250080	Number 8	82	84	1.02				
54050140	Joseph S. Stackhouse E.S.	54	54	1.00				
170220080	Mary J Donohoe #4	59	59	1.00				

Table 15: Grade 4 - Mean Student WTR Erasure Rate for LAL by School – Operational Only with Infit and Outfit Flags

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
110540130	West Ave	82	260	3.17				
133570430	Franklin E.S.	70	218	3.11				
10590055	John C. Milanesi Elem Sch	74	189	2.55				
34380060	Grant	31	78	2.52	1	1		
10110080	Uptown School Complex	72	172	2.39				
133570170	Abington Ave	70	159	2.27				
10110050	Chelsea Heights	35	74	2.11				
130410080	Carteret	45	92	2.04			1	
294210060	Ocean Road Elem	103	205	1.99				
30890080	Number 6	48	95	1.98				

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
135680130	Hazel Ave	58	108	1.86				
70680270	Powell E.S.	33	60	1.82				
133570180	Alexander St	88	157	1.78				
806665930	Gray Cs	36	63	1.75		1		
133570300	Burnet St	42	72	1.71				
290320040	H & M Potter E.S.	87	149	1.71				
30890050	Number 3	41	70	1.71				
391320150	No 12 Elmora	71	121	1.70				
131210110	Dionne Warwick Institute	68	114	1.68				
130410060	Brookdale	43	70	1.63		1		
172210065	Connors	45	68	1.51				
110950025	Haleyville-Mauricetown	61	92	1.51			1	
133570420	Fourteenth Avenue E.S.	32	48	1.50				
806910940	Jersey City Community Cs	68	100	1.47	1		1	1
32740065	Hilltop	48	69	1.44				
175240118	Veteran's Memorial School	82	114	1.39				
34380080	Roosevelt	62	86	1.39				
808065980	University Heights Cs	38	52	1.37				
133570710	Sussex Ave	39	53	1.36				
131210170	J Garfield Jackson Sr Acd	49	66	1.35				
133570200	Ann St	139	187	1.35				
172390260	Gladys Nunnery	65	87	1.34				
131210093	Fourth Avenue School	37	49	1.32		1		
235850210	Lynn Crest	38	50	1.32				

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
133880070	Cleveland St	40	52	1.30				
151330010	Aura	45	58	1.29	1	1	1	
33600060	Jefferson	49	63	1.29	1			
170220050	Henry E Harris #1	70	89	1.27				
35410050	Julia A Traphagen	74	94	1.27	1	1		
133570350	Cleveland	34	43	1.26			1	1
133570590	Oliver St	80	101	1.26				
295190065	Cedar Grove Elem	142	178	1.25				
175240090	Hudson	65	81	1.25				
131210050	Edward T. Bowser Sr.	114	140	1.23				
70880010	Clementon Elem	46	54	1.17				
234090200	Robert N. Wilentz E.S.	127	148	1.17				
215210270	Parker	55	64	1.16				
292520084	Oak Street Elem School	125	145	1.16				
233530125	Roosevelt Elem	93	107	1.15				
394550060	Ernest J Finizio-Aldene	37	42	1.14				
807420940	Oceanside Cs	38	43	1.13				
133570580	Newton St	46	52	1.13				
133570530	Miller St	39	44	1.13				
293820030	Frederic A. Priff Elem	56	63	1.13				
335910060	Mary S Shoemaker	87	97	1.11				
132330110	Grove St	62	69	1.11			1	1

Table 16: Grade 5 - Mean Student WTR Erasure Rate for LAL by School – Operational Only with Infit and Outfit Flags

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
133570575	Rafael Hernandez School	128	525	4.10				
133570170	Abington Ave	65	218	3.35				
131210093	Fourth Avenue School	48	131	2.73				
235850140	Ford Avenue	41	106	2.59		1		
133880060	Central	39	86	2.21				
235850100	Avenel Street	65	134	2.06				
131210080	Langston Hughes School	72	147	2.04				
294210060	Ocean Road Elem	86	174	2.02				
235850220	Mawbey Street	49	88	1.80	1	1		
32860110	Roosevelt	32	57	1.78				
211245060	Grace Norton Rogers Sch	70	121	1.73				
131210090	Whitney E. Houston Acad	67	115	1.72				
31450140	Warren Point	75	128	1.71				
271190030	Central	136	222	1.63				
211950110	Greenwood	44	68	1.55				
133570580	Newton St	42	63	1.50				
310900080	Number 1	37	55	1.49	1			
311920015	Haledon Public Sch	106	157	1.48				
31700080	Lincoln School #6	52	77	1.48				
32080080	Lincoln	73	108	1.48				
30300040	Franklin	75	110	1.47				
14180060	Washington Avenue Elem.	33	48	1.45				
51030030	Pearson School	38	55	1.45				

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
175240110	Roosevelt	101	144	1.43				
175240090	Hudson	66	94	1.42				
394550060	Ernest J Finizio-Aldene	46	65	1.41				
350510050	Old York	102	144	1.41				
30890060	Number 4	44	62	1.41				
214255090	Riverside	37	52	1.41		1		1
235850275	Port Reading	80	112	1.40				
130410080	Carteret	61	85	1.39			1	
235850210	Lynn Crest	39	54	1.38				
172410100	Roosevelt	78	108	1.38				
310900140	Number 8	47	65	1.38				
32090050	Haworth	55	76	1.38				
133570610	Ridge St	63	87	1.38				
131210110	Dionne Warwick Institute	74	102	1.38				
151330010	Aura	48	66	1.38				
130660070	Jefferson	59	79	1.34	1			
10590055	John C. Milanesi Elem Sch	69	92	1.33				
295190080	North Dover Elem	120	159	1.33				

Table 17: Grade 6 - Mean Student WTR Erasure Rate for LAL by School – Operational Only with Infit and Outfit Flags

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
31580015	Franklin Ave Middle Sch	36	297	8.25		1		
133880110	Oakwood Ave	32	161	5.03				
133570575	Rafael Hernandez School	137	497	3.63				
807730970	Robert Treat Academy Cs	50	165	3.30				
34380060	Grant	36	109	3.03				
133570170	Abington Ave	69	182	2.64				
133570580	Newton St	30	62	2.07		1		
314010080	Number 4	80	165	2.06				1
133880060	Central	31	61	1.97				
151100140	Shady Lane	55	105	1.91				
175670065	Number 2	88	168	1.91				
153490050	National Park	47	89	1.89				
30890050	Number 3	43	81	1.88				

Table 18: Grade 7 - Mean Student WTR Erasure Rate for LAL by School – Operational Only with Infit and Outfit Flags

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
133570575	Rafael Hernandez School	126	412	3.27				
311920015	Haledon Public Sch	117	295	2.52				
70880010	Clementon Elem	62	138	2.23				
133570170	Abington Ave	68	132	1.94			1	
391320180	No 15 C Columbus	41	75	1.83				

806420925	Elysian Cs Of Hoboken	32	58	1.81		
32090050	Haworth	61	109	1.79		
110540055	Cherry Street	51	91	1.78		1
391320030	No 7 Terence C. Reilly Es	74	130	1.76		
391320200	No 17 T Roosevelt	48	83	1.73		
314010044	Build Academy	40	68	1.70		
394670060	Park Middle	230	388	1.69		
254770050	Shrewsbury Elem	55	92	1.67		
292500050	Lakehurst Elem	44	73	1.66		1
806013900	Bergen Arts And Sciences Chart	60	99	1.65		
233530090	Livingston	48	79	1.65		
133570480	Lafayette St	59	97	1.64		
10110030	Sovereign Ave School	51	16	0.31		
391320100	No 2 Winfield Scott	38	10	0.26	1	1
314010110	Number 7	59	15	0.25		
111020040	Deerfield	42	10	0.24		

Table 19: Grade 8 - Mean Student WTR Erasure Rate for LAL by School – Operational Only with Infit and Outfit Flags

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
133570575	Rafael Hernandez School	110	696	6.33			1	1
133570170	Abington Ave	102	556	5.45				
172390300	Rafael De J Cordero No 37	59	186	3.15				
133570530	Miller St	53	154	2.91				1
70580010	Alice Costello	42	119	2.83				
170220085	Midtown Community Sch #8	123	313	2.54				
311920015	Haledon Public Sch	114	285	2.50				
131750050	Glen Ridge High	85	193	2.27				
34470050	Midland #1	50	113	2.26				
170220050	Henry E Harris #1	60	135	2.25				
251660023	Clifton T. Barkalow	278	608	2.19				
395000060	Florence M. Gaudineer	107	222	2.07				
292500050	Lakehurst Elem	42	86	2.05			1	

Table 20: Descriptive Statistics by Grade Level in Mathematics – Operational Only

Grade	Mean WTR Erasure Rate	Standard Deviation	2 SD Above Mean	2 SD Below Mean
3	1.16	0.52	2.19	0.13
4	1.08	0.45	1.97	0.19
5	0.86	0.36	1.59	0.14
6	0.89	0.38	1.64	0.13
7	0.74	0.31	1.36	0.12
8	0.90	0.34	1.58	0.22

Table 21: Grade 3 - Mean Student WTR Erasure Rate for Math by School – Operational Only with Infit and Outfit Flags

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
133570630	Roseville Avenue E.S.	39	247	6.33				
391320230	No 20 John Marshall	49	264	5.39	1			
133570575	Rafael Hernandez School	36	180	5.00				
391320180	No 15 C Columbus	62	254	4.10	1			1
130410080	Carteret	61	246	4.03				
133570580	Newton St	38	147	3.87				
235850100	Avenel Street	87	329	3.78		1		
133570180	Alexander St	95	359	3.78				
211950150	Kisthardt	38	134	3.53				
110950025	Haleyville-Mauricetown	62	218	3.52				
172210065	Connors	46	160	3.48			1	
133570250	Bragaw Ave	49	169	3.45	1			1
133570170	Abington Ave	92	312	3.39	1			
806910940	Jersey City Community Cs	71	240	3.38	1		1	1
131210093	Fourth Avenue School	64	210	3.28				
175240120	Washington	84	274	3.26				
235850280	Ross Street	95	305	3.21				
131210130	Gordon Parks Academy	47	145	3.09			1	
34470050	Midland #1	43	126	2.93				
394550060	Ernest J Finizio-Aldene	45	126	2.80				
175240118	Veteran's Memorial School	77	214	2.78				
31700080	Lincoln School #6	48	133	2.77				
133570300	Burnet St	43	115	2.67	1		1	

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
172390120	Number 8	100	258	2.58				
110540100	Quarter Mile Lane	49	126	2.57				
173610100	Mckinley No 10	42	107	2.55				
132330110	Grove St	55	140	2.55				
311920015	Haledon Public Sch	105	267	2.54				
133570435	George Washington Carver	64	162	2.53				
391320035	No 4 John Battin Es	73	184	2.52				
175670070	Number 3	52	130	2.50				
175240090	Hudson	73	182	2.49				
235850140	Ford Avenue	58	143	2.47		1		
30300050	Hoover	43	106	2.47				
295220050	Tuckerton Elem	30	73	2.43				
391320200	No 17 T Roosevelt	52	126	2.42			1	
133570430	Franklin E.S.	98	237	2.42				
14180060	Washington Avenue Elem.	50	120	2.40				
391320260	No 23 N M Butler	83	197	2.37				
175240130	Robert Waters	148	351	2.37				
133570710	Sussex Ave	57	134	2.35				
30890050	Number 3	41	96	2.34				
33600080	Washington	33	77	2.33				
133570530	Miller St	48	112	2.33				
10110070	New York Avenue School	54	125	2.31				
130250055	Number 4	51	118	2.31				
235850210	Lynn Crest	49	113	2.31		1		

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
131210080	Langston Hughes School	74	170	2.30				
133570610	Ridge St	64	146	2.28				1
133570200	Ann St	151	344	2.28				
112270060	Hopewell Crest	61	138	2.26				
172390200	Number 22	75	169	2.25				
292360030	Crawford-Rodriguez Elem	126	283	2.25				
295190070	East Dover Elem	116	260	2.24				
133570600	Peshine Ave	48	107	2.23				
53440050	Hillside E.S.	84	187	2.23				
131210050	Edward T. Bowser Sr.	122	271	2.22				

Table 22: Grade 4 - Mean Student WTR Erasure Rate for Math by School – Operational Only with Infit and Outfit Flags

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
34380060	Grant	31	143	4.61		1		
110540130	West Ave	82	369	4.50				
33600060	Jefferson	50	190	3.80	1	1		
133570170	Abington Ave	76	279	3.67				
30890080	Number 6	50	174	3.48				
10110080	Uptown School Complex	72	244	3.39	1			
133570180	Alexander St	88	285	3.24	1			
10110050	Chelsea Heights	36	115	3.19				
133570530	Miller St	41	126	3.07				

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
175240120	Washington	85	257	3.02				
151330010	Aura	45	136	3.02				
131210110	Dionne Warwick Institute	67	195	2.91				
35410050	Julia A Traphagen	74	209	2.82		1	1	
131210090	Whitney E. Houston Acad	61	172	2.82				
131210093	Fourth Avenue School	45	123	2.73				
133880070	Cleveland St	41	112	2.73				
133570420	Fourteenth Avenue E.S.	32	87	2.72				
314010050	Number 1	32	85	2.66				
806665930	Gray Cs	36	95	2.64	1			
34380080	Roosevelt	62	161	2.60		1		
172210065	Connors	45	114	2.53				
110950025	Haleyville-Mauricetown	56	141	2.52				
211950150	Kisthardt	37	92	2.49				
806910940	Jersey City Community Cs	68	165	2.43				1
55805080	W.R. James Sr. E.S.	72	174	2.42				
808065980	University Heights Cs	38	91	2.39				
31130070	Lincoln	37	88	2.38	1			
133570280	Broadway E.S.	61	143	2.34	1		1	
14180060	Washington Avenue Elem.	38	87	2.29				
130410130	Franklin	41	93	2.27	1			
32080060	Euclid	65	146	2.25				
53440010	Countryside E.S.	61	137	2.25				
391320150	No 12 Elmora	75	166	2.21				

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
30440050	Lillian M. Steen	38	84	2.21				
392190110	George Washington	77	170	2.21				
172390260	Gladys Nunnery	66	145	2.20				
807820970	Schomburg Cs	36	79	2.19				
30890050	Number 3	44	94	2.14				
74060120	Delair	85	181	2.13				
130410060	Brookdale	43	91	2.12		1	1	
175240118	Veteran's Memorial School	83	175	2.11				
295190065	Cedar Grove Elem	143	300	2.10				
806420925	Elysian Cs Of Hoboken	32	67	2.09	1		1	1
133570610	Ridge St	63	130	2.06				
807730970	Robert Treat Academy Cs	51	105	2.06				
175240140	Woodrow Wilson	38	78	2.05	1	1		
133570590	Oliver St	84	172	2.05				
175240130	Robert Waters	134	270	2.01			1	
235850100	Avenel Street	86	173	2.01				
314010250	Number 21	88	175	1.99				

Table 23: Grade 5 - Mean Student WTR Erasure Rate for Math by School – Operational Only with Infit and Outfit Flags

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
133570575	Rafael Hernandez School	130	542	4.17				
807290957	New Horizons Community Cs	39	140	3.59				
133570170	Abington Ave	66	229	3.47				
131210090	Whitney E. Houston Acad	67	224	3.34				
133570350	Cleveland	35	115	3.29				
131210093	Fourth Avenue School	49	145	2.96				1
235850140	Ford Avenue	41	120	2.93	1			
133880060	Central	39	106	2.72				
311920015	Haledon Public Sch	108	286	2.65				
130410080	Carteret	62	163	2.63				
34380080	Roosevelt	65	167	2.57				
394550060	Ernest J Finizio-Aldene	46	103	2.24				
133570580	Newton St	42	93	2.21				
172390260	Gladys Nunnery	51	110	2.16				
391320180	No 15 C Columbus	46	96	2.09				1
175240090	Hudson	67	133	1.99				
211950110	Greenwood	44	86	1.95				
132330110	Grove St	59	111	1.88				
172390190	Number 20	92	173	1.88				
806665930	Gray Cs	31	58	1.87				
10590045	Collings Lake Elem Sch	38	70	1.84				
151330010	Aura	48	87	1.81				
133570200	Ann St	138	247	1.79				

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
131210080	Langston Hughes School	74	132	1.78				
31700080	Lincoln School #6	54	95	1.76				
133880070	Cleveland St	35	61	1.74				
313640050	High Mountain	78	135	1.73				
133570530	Miller St	37	64	1.73				
235850210	Lynn Crest	39	67	1.72	1	1		
391320230	No 20 John Marshall	37	63	1.70			1	
31450160	Westmoreland	48	81	1.69				
211245060	Grace Norton Rogers Sch	72	120	1.67				
130250070	Number 7	59	97	1.64				
113230085	Rieck Ave	71	116	1.63				
130410140	Oak View	35	57	1.63				
294210060	Ocean Road Elem	87	141	1.62				

Table 24: Grade 6 - Mean Student WTR Erasure Rate for Math by School – Operational Only with Infit and Outfit Flags

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
133570575	Rafael Hernandez School	141	742	5.26	1		1	
133570170	Abington Ave	73	362	4.96	1		1	
34380060	Grant	36	131	3.64		1		
807730970	Robert Treat Academy Cs	50	141	2.82	1	1	1	
133570350	Cleveland	34	86	2.53				
170220085	Midtown Community Sch #8	119	282	2.37				
133570530	Miller St	52	119	2.29				
34380080	Roosevelt	53	112	2.11		1		
31580015	Franklin Ave Middle Sch	171	361	2.11		1		
34380070	Lincoln Elem School	53	106	2.00				
130250060	Number 5	58	115	1.98				1
251260060	Margaret L Vetter	39	75	1.92	1			
133570610	Ridge St	78	145	1.86				
251260110	Woodmere	38	70	1.84				
30890050	Number 3	43	75	1.74	1			
31550060	Number 1	90	156	1.73	1	1		
134530020	Lester C Noecker	63	104	1.65				

Table 25: Grade 7 - Mean Student WTR Erasure Rate for Math by School – Operational Only with Infit and Outfit Flags

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
133570170	Abington Ave	75	421	5.61				
133570575	Rafael Hernandez School	138	395	2.86				
311920015	Haledon Public Sch	118	268	2.27			1	
807503970	Paterson Cs For Science And Te	83	182	2.19				
133570300	Burnet St	33	62	1.88	1			1
110540055	Cherry Street	51	89	1.75				
170220085	Midtown Community Sch #8	126	208	1.65				
35830070	Greta Ostrovsky Middle	97	158	1.63				
133880120	Park Ave	42	64	1.52				
334280050	Quinton Twp	32	48	1.50				
133570530	Miller St	40	60	1.50				
411870060	Hackettstown Middle	100	141	1.41				

Table 26: Grade 8 - Mean Student WTR Erasure Rate for Math by School – Operational Only with Infit and Outfit Flags

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
133570170	Abington Ave	108	638	5.91				
170220085	Midtown Community Sch #8	126	441	3.50				
133570530	Miller St	54	132	2.44				
292500050	Lakehurst Elem	42	97	2.31				
807503970	Paterson Cs For Science And Te	83	162	1.95				
355540050	Valley View	83	155	1.87	1		1	
311920015	Haledon Public Sch	114	212	1.86				
35830070	Greta Ostrovsky Middle	74	126	1.70				1
133570605	Quitman Community School	47	79	1.68				
35880050	Woodcliff Middle School	103	172	1.67		1		
271530030	Ridgedale	110	182	1.65				
393470030	Deerfield Elementary	76	124	1.63				
32090050	Haworth	64	103	1.61				
133570180	Alexander St	56	90	1.61	1		1	
252720050	Markham Place	86	136	1.58				

Table 27: Descriptive Statistics by Grade Level in Science – Operational Only

Grade	Mean WTR Erasure Rate	Standard Deviation	2 SD Above Mean	2 SD Below Mean
4	0.76	0.29	1.35	0.17
8	1.19	0.39	1.98	0.40

Table 28: Grade 4 - Mean Student WTR Erasure Rate for Science by School – Operational Only with Infit and Outfit Flags

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
34380060	Grant	31	100	3.23	1	1		
133570180	Alexander St	88	266	3.02				
30890080	Number 6	50	140	2.80	1			
110540130	West Ave	82	229	2.79				
130410060	Brookdale	43	118	2.74			1	
33600060	Jefferson	50	127	2.54	1	1		
34380080	Roosevelt	63	158	2.51			1	
10110050	Chelsea Heights	36	86	2.39				
131210110	Dionne Warwick Institute	68	151	2.22				
133880070	Cleveland St	41	91	2.22				
175240118	Veteran's Memorial School	83	173	2.08				
35410050	Julia A Traphagen	74	146	1.97				
133570170	Abington Ave	76	147	1.93				
133570530	Miller St	41	79	1.93				
133570300	Burnet St	42	80	1.90				
131210093	Fourth Avenue School	45	85	1.89				
806910940	Jersey City Community Cs	68	124	1.82				
133570710	Sussex Ave	42	73	1.74				
31130070	Lincoln	37	60	1.62				
151330010	Aura	45	71	1.58				
32740065	Hilltop	49	76	1.55			1	
133570200	Ann St	142	218	1.54				
35160080	Malcolm S Mackay	66	101	1.53				

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
133570350	Cleveland	35	53	1.51				
295190065	Cedar Grove Elem	143	216	1.51				
53440010	Countryside E.S.	61	92	1.51				
175240140	Woodrow Wilson	38	57	1.50		1		
215210220	Harrison	45	67	1.49				
175670065	Number 2	66	97	1.47				
133570330	Chancellor Ave	62	91	1.47				
215210270	Parker	55	80	1.45				
10110070	New York Avenue School	48	69	1.44				
34380070	Lincoln Elem School	51	73	1.43				
30440050	Lillian M. Steen	38	54	1.42				
155500027	Birches	108	153	1.42				
133570420	Fourteenth Avenue E.S.	32	45	1.41				
806420925	Elysian Cs Of Hoboken	32	45	1.41	1		1	
35920020	Calvin Coolidge	72	101	1.40				
74060120	Delair	85	119	1.40				
215210310	Wilson	30	42	1.40				
235850210	Lynn Crest	38	53	1.39		1		
172390260	Gladys Nunnery	66	92	1.39			1	1
133880060	Central	34	47	1.38				
133570600	Peshine Ave	50	68	1.36				

Table 29: Grade 8 - Mean Student WTR Erasure Rate for Science by School – Operational Only with Infit and Outfit Flags

School Code	School Name	No. Students	No. of Wrong to Right Erasures	Mean No. of WTR Erasures Per Student	Infit Flag	Outfit Flag	Z-In Flag	Z-Out Flag
133570170	Abington Ave	108	714	6.61				
133570575	Rafael Hernandez School	113	327	2.89				
254980050	H W Mountz Elem	35	94	2.69				
271530030	Ridgedale	110	262	2.38				
274000030	Central	136	315	2.32				
31070040	Demarest Middle	72	158	2.19			1	
175240140	Woodrow Wilson	55	117	2.13				
255640050	Frank Antonides	75	159	2.12				
170220140	Number 14	53	112	2.11				
231290055	John Adams Middle	232	482	2.08				
234860150	Crossroads North	322	656	2.04				
252720050	Markham Place	86	171	1.99				
133570510	Maple Ave School	83	32	0.39				

The following observations can be made from the Tables in Part 2:

1. The erasures analysis results from Part 2 (Tables 14-19, 21-26, and 28-29) which lists schools with high WTR erasure rates and associated poor person-fit flag by grade for LAL, mathematics, and science shows that the number of schools flagged for high erasure rates are higher in lower grades (grades 3-5) in all subject areas. The school Abington Ave was the only one flagged for high WTR erasure rates for all grades and subject areas.
2. When comparing schools that were flagged for high erasure rates with the schools flagged for high poor person-fit rates, at least 49 schools across grades and subject areas were flagged from both approaches. However, the schools with the highest WTR erasure rates per student were not necessarily flagged for high person-fit rates. For example, Franklin E.S. was flagged for the highest erasure rate but not for poor person-fit rate in grade 3 LAL.
3. Among the schools that were flagged for high erasure rates, at least 18 schools across grades and subject areas were also flagged from the multiple person-fit measures. However, no schools were flagged from all four measures (InFit, OutFit, Z-In, and Z-Out).
4. At least two schools in LAL and three schools in mathematics were flagged for high poor person-fit rates in multiple grades (Tables 14-19 and 21-26).
5. The percentage of schools by grade and subject flagged for poor person-fit among the schools flagged for high WTR erasures ranged from 7.7% in grade 8 science to 58.8% in grade 6 mathematics. The percentage range for LAL was 10.7% to 23.1%, for mathematics was 13.9% to 58.5%, and for science was 7.7% to 22.7%.

Reference

Linacre, J. M. (2006). A User's Guide to W I N S T E P S® M I N I S T E P Rasch-Model Computer Programs. www.winsteps.com