APPENDIX A: THE 2010 MSA-MATH STRATIFIED RANDOM SAMPLING

Since reporting deadlines made it difficult to use the Maryland school population as calibration and equating data set, Pearson used to use equating samples instead of the population. For this year, however, Pearson was able to use 80% of the whole population for grades 6, 7, and 8 equating. Therefore, stratified random sampling was conducted for only grades, 3, 4, and 5.

Pearson chose Local Education Agency (LEA) as one of the most important variables for stratification. Based on the population percentage of each LEA, Pearson randomly selected about 3,000 students for those grades from first-waved documents (i.e., 40% of the statewide population) which were randomly distributed and completely scored. It should be noted that this method has been applied since the 2006 assessment.

To verify that the sample was representative of the statewide examinee population in terms of gender and ethnicity, the distributions of gender and ethnicity of the 2010 samples were compared with the 2010 population. The results are shown in this Appendix. The percentages of students from the LEAs were all within 1 percentage point of the target values across all grades. The percentages of students from the five major ethnic groups were all within 3 percentage points of the target values across all grades. The percentages of male and female students were within 3 percentage points of the target values across all grades. Consequently, we concluded that the 2010 equating samples were representative of the 2010 statewide examinee population in terms of LEA, gender, and ethnicity.

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Table A.1 2010 MSA-Mathematics Population and Stratified Random Sampling (S.R.S): Grade 3 LEA

LEA	Operational Form A				Operational Form F			
	2010 Pop. %	2010 S. R. S.	% of 2010 S. R. S.	% of Differ.	2010 Pop. %	2010 S. R. S.	% of 2010 S. R. S.	% of Differ.
1	1.08%	32	1.09%	-0.02	1.08	32	1.09%	-0.01
2	9.18%	276	9.33%	-0.14	8.73	276	9.30%	-0.12
3	12.29%	369	12.48%	-0.19	12.39	369	12.45%	-0.16
4	2.01%	60	2.04%	-0.03	1.93	60	2.03%	-0.03
5	0.69%	21	0.70%	-0.01	0.68	21	0.70%	-0.01
6	3.31%	99	3.36%	-0.05	3.28	99	3.35%	-0.04
7	1.87%	56	1.90%	-0.03	1.89	56	1.89%	-0.02
8	2.88%	76	2.57%	0.31	2.98	80	2.70%	0.18
9	0.57%	0	0.00%	0.57	0.55	0	0.00%	0.57
10	4.74%	142	4.82%	-0.07	4.77	142	4.80%	-0.06
11	0.48%	0	0.00%	0.48	0.53	0	0.00%	0.48
12	4.48%	134	4.55%	-0.07	4.76	134	4.53%	-0.06
13	5.92%	178	6.02%	-0.09	5.81	178	6.00%	-0.08
14	0.23%	7	0.24%	0.00	0.27	7	0.24%	0.00
15	16.70%	501	16.96%	-0.26	16.75	501	16.92%	-0.21
16	14.23%	427	14.45%	-0.22	14.52	427	14.41%	-0.18
17	0.87%	26	0.88%	-0.01	0.91	26	0.88%	-0.01
18	2.02%	61	2.05%	-0.03	1.92	61	2.05%	-0.03
19	0.35%	11	0.36%	-0.01	0.35	11	0.35%	0.00
20	0.50%	15	0.51%	-0.01	0.49	15	0.51%	-0.01
21	2.71%	81	2.75%	-0.04	2.76	81	2.75%	-0.03
22	1.94%	58	1.97%	-0.03	1.96	58	1.97%	-0.02
23	0.84%	25	0.85%	-0.01	0.72	25	0.85%	-0.01
24	0.13%	0	0.00%	0.13	0.06	4	0.13%	0.00
30	9.97%	299	10.12%	-0.15	9.91	299	10.10%	-0.13
Total	100.00%	2954	100.00%	0.00	100.00	2962	100.00%	0.00

Note. 1. Allegany; 2. Anne Arundel; 3. Baltimore; 4. Calvert; 5. Caroline; 6. Carroll; 7. Cecil; 8. Charles; 9. Dorchester; 10. Frederick; 11. Garrett; 12. Harford; 13. Howard; 14. Kent; 15. Montgomery; 16. Prince George's; 17. Queen Anne's; 18. St. Mary's; 19. Somerset; 20. Talbot; 21. Washington; 22. Wicomico; 23. Worcester; 24. LEA 24; 30. Baltimore City.

Table A.2 2010 MSA-Mathematics Population and Stratified Random Sampling (S.R.S): Grade 3 LEA

	Operational Form A				Operational Form F			
Race	2010 Pop. %	2010 S.R.S.	% of 2010 S.R.S	% of Differ.	2010 Pop. %	2010 S.R.S.	% of 2010 S.R.S	% of Differ.
1	0.59	18	0.61	-0.02	0.64	19	0.64	0.00
2	7.70	195	6.60	1.10	7.70	197	6.65	1.04
3	36.88	1101	37.27	-0.39	36.86	1103	37.24	-0.38
4	33.87	1096	37.10	-3.23	33.83	1094	36.93	-3.10
5	20.78	540	18.28	2.49	20.83	545	18.40	2.43
Miss	0.19	4	0.14	0.05	0.13	4	0.14	0.00
Total	100.0	2954	100.0	0.00	100.0	2962	100.0	0.00

Note. 1. American Indian; 2 Asian American; 3. African American; 4. White; 5. Hispanic; Miss: Missing

Table A.3 2010 MSA-Mathematics Population and Stratified Random Sampling (S.R.S): Grade 3 LEA

	Operational Form A				Operational Form F			
Gender	2010 Pop. %	2010 S.R.S.	% of 2010 S.R.S	% of Differ.	2010 Pop. %	2010 S.R.S.	% of 2010 S.R.S	% of Differ.
1	51.24	1526	51.66	-0.42	50.01	1528	51.59	-1.58
2	48.58	1424	48.21	0.38	49.86	1429	48.24	1.61
Miss	0.18	4	0.14	0.05	0.13	5	0.17	-0.03
Total	100.0	2954	100.0	0.00	100.0	2962	100.0	0.00

Note. 1. Male; 2. Female; Miss: Missing

Table A.4 2010 MSA-Mathematics Population and Stratified Random Sampling (S.R.S): Grade 4 LEA

LEA	Operational Form A				Operational Form F			
	2010 Pop. %	2010 S. R. S.	% of 2010 S. R. S.	% of Differ.	2010 Pop. %	2010 S. R. S.	% of 2010 S. R. S.	% of Differ.
1	1.10%	33	1.12%	-0.01	1.10%	33	1.12%	-0.01
2	9.17%	275	9.29%	-0.12	9.17%	275	9.29%	-0.12
3	12.28%	368	12.45%	-0.17	12.28%	368	12.45%	-0.17
4	1.97%	59	1.99%	-0.03	1.97%	59	1.99%	-0.03
5	0.70%	21	0.71%	-0.01	0.70%	21	0.71%	-0.01
6	3.31%	99	3.36%	-0.04	3.31%	99	3.36%	-0.04
7	1.89%	57	1.92%	-0.03	1.89%	57	1.92%	-0.03
8	3.07%	92	3.11%	-0.04	3.07%	92	3.11%	-0.04
9	0.53%	0	0.00%	0.53	0.53%	0	0.00%	0.53
10	4.72%	142	4.79%	-0.06	4.72%	142	4.79%	-0.06
11	0.53%	0	0.00%	0.53	0.53%	0	0.00%	0.53
12	4.80%	144	4.87%	-0.07	4.80%	144	4.87%	-0.07
13	6.02%	180	6.10%	-0.08	6.02%	180	6.10%	-0.08
14	0.28%	0	0.00%	0.28	0.28%	0	0.00%	0.28
15	16.78%	503	17.01%	-0.23	16.78%	503	17.01%	-0.23
16	14.12%	423	14.31%	-0.19	14.12%	423	14.31%	-0.19
17	0.90%	27	0.91%	-0.01	0.90%	27	0.91%	-0.01
18	1.97%	59	1.99%	-0.03	1.97%	59	1.99%	-0.03
19	0.33%	10	0.34%	0.00	0.33%	10	0.34%	0.00
20	0.51%	15	0.52%	-0.01	0.51%	15	0.52%	-0.01
21	2.75%	82	2.79%	-0.04	2.75%	82	2.79%	-0.04
22	1.92%	58	1.95%	-0.03	1.92%	58	1.95%	-0.03
23	0.71%	21	0.72%	-0.01	0.71%	21	0.72%	-0.01
24	0.17%	5	0.17%	0.00	0.17%	5	0.17%	0.00
30	9.47%	284	9.60%	-0.13	9.47%	284	9.60%	-0.13
Total	100.00%	2957	100.00%	0.00	100.00%	2957	100.00%	0.00

Note. 1. Allegany; 2. Anne Arundel; 3. Baltimore; 4. Calvert; 5. Caroline; 6. Carroll; 7. Cecil; 8. Charles; 9. Dorchester; 10. Frederick; 11. Garrett; 12. Harford; 13. Howard; 14. Kent; 15. Montgomery; 16. Prince George's; 17. Queen Anne's; 18. St. Mary's; 19. Somerset; 20. Talbot; 21. Washington; 22. Wicomico; 23. Worcester; 24. LEA 24; 30. Baltimore City.

Table A.5 2010 MSA-Mathematics Population and Stratified Random Sampling (S.R.S): Grade 4 LEA

	Operational Form A				Operational Form F			
Race	2010 Pop. %	2010 S.R.S.	% of 2010 S.R.S	% of Differ.	2010 Pop. %	2010 S.R.S.	% of 2010 S.R.S	% of Differ.
1	0.70	17	0.57	0.12	0.59	15	0.51	0.08
2	7.71	196	6.63	1.08	7.44	193	6.53	0.91
3	36.36	1054	35.64	0.71	36.13	1066	36.05	0.08
4	36.02	1138	38.48	-2.47	36.41	1110	37.54	-1.13
5	19.07	549	18.57	0.50	19.24	568	19.21	0.04
Miss	0.15	3	0.10	0.05	0.18	5	0.17	0.02
Total	100.0	2957	100.0	0.00	100.0	2957	100.0	0.00

Note. 1. American Indian; 2 Asian American; 3. African American; 4. White; 5. Hispanic; Miss: Missing

Table A.6 2010 MSA-Mathematics Population and Stratified Random Sampling (S.R.S): Grade 4 LEA

	Operational Form A				Operational Form F			
Gender	2010 Pop. %	2010 S.R.S.	% of 2010 S.R.S	% of Differ.	2010 Pop. %	2010 S.R.S.	% of 2010 S.R.S	% of Differ.
1	50.90	1553	52.52	-1.62	50.90	1481	50.08	0.81
2	48.96	1401	47.38	1.58	48.94	1471	49.75	-0.81
Miss	0.14	3	0.10	0.04	0.16	5	0.17	-0.01
Total	100.0	2957	100.0	0.00	100.0	2957	100.0	0.00

Note. 1. Male; 2. Female; Miss: Missing

Table A.7 2010 MSA-Mathematics Population and Stratified Random Sampling (S.R.S): Grade 5 LEA

LEA	Operational Form A				Operational Form F			
	2010 Pop. %	2010 S. R. S.	% of 2010 S. R. S.	% of Differ.	2010 Pop. %	2010 S. R. S.	% of 2010 S. R. S.	% of Differ.
1	1.05%	32	1.07%	-0.01	1.05%	32	1.07%	-0.01
2	9.22%	277	9.34%	-0.12	9.22%	277	9.34%	-0.12
3	12.63%	379	12.79%	-0.17	12.63%	379	12.79%	-0.17
4	2.07%	62	2.10%	-0.03	2.07%	62	2.10%	-0.03
5	0.61%	18	0.62%	-0.01	0.61%	18	0.62%	-0.01
6	3.24%	97	3.28%	-0.04	3.24%	97	3.28%	-0.04
7	1.94%	58	1.97%	-0.03	1.94%	58	1.97%	-0.03
8	2.92%	88	2.96%	-0.04	2.92%	88	2.96%	-0.04
9	0.51%	0	0.00%	0.51	0.51%	0	0.00%	0.51
10	4.67%	140	4.73%	-0.06	4.67%	140	4.73%	-0.06
11	0.53%	0	0.00%	0.53	0.53%	0	0.00%	0.53
12	4.65%	139	4.71%	-0.06	4.65%	139	4.71%	-0.06
13	5.91%	177	5.99%	-0.08	5.91%	177	5.99%	-0.08
14	0.26%	0	0.00%	0.26	0.26%	0	0.00%	0.26
15	16.62%	499	16.84%	-0.22	16.62%	499	16.84%	-0.22
16	14.08%	422	14.26%	-0.18	14.08%	422	14.26%	-0.18
17	0.91%	27	0.92%	-0.01	0.91%	27	0.92%	-0.01
18	2.06%	62	2.09%	-0.03	2.06%	62	2.09%	-0.03
19	0.35%	11	0.36%	0.00	0.35%	11	0.36%	0.00
20	0.49%	15	0.50%	-0.01	0.49%	15	0.50%	-0.01
21	2.75%	82	2.78%	-0.04	2.75%	82	2.78%	-0.04
22	1.95%	58	1.97%	-0.03	1.95%	58	1.97%	-0.03
23	0.77%	23	0.78%	-0.01	0.77%	23	0.78%	-0.01
24	0.25%	8	0.26%	0.00	0.25%	8	0.26%	0.00
30	9.56%	287	9.68%	-0.13	9.56%	287	9.68%	-0.13
Total	100.00%	2961	100.00%	0.00	100.00%	2961	100.00%	0.00

Note. 1. Allegany; 2. Anne Arundel; 3. Baltimore; 4. Calvert; 5. Caroline; 6. Carroll; 7. Cecil; 8. Charles; 9. Dorchester; 10. Frederick; 11. Garrett; 12. Harford; 13. Howard; 14. Kent; 15. Montgomery; 16. Prince George's; 17. Queen Anne's; 18. St. Mary's; 19. Somerset; 20. Talbot; 21. Washington; 22. Wicomico; 23. Worcester; 24. LEA 24; 30. Baltimore City.

Table A.8 2010 MSA-Mathematics Population and Stratified Random Sampling (S.R.S): Grade 5 LEA

Race	Operational Form A				Operational Form F			
	2010 Pop. %	2010 S.R.S.	% of 2010 S.R.S	% of Differ.	2010 Pop. %	2010 S.R.S.	% of 2010 S.R.S	% of Differ.
1	0.46	14	0.47	-0.01	0.58	13	0.44	0.14
2	6.74	181	6.11	0.62	7.04	189	6.38	0.66
3	39.28	1110	37.49	1.79	39.07	1137	38.40	0.67
4	36.13	1118	37.76	-1.63	36.25	1098	37.08	-0.83
5	17.19	534	18.03	-0.85	16.87	516	17.43	-0.56
Miss	0.22	4	0.14	0.08	0.19	8	0.27	-0.08
Total	100.0	2961	100.0	0.00	100.0	2961	100.0	0.00

Note. 1. American Indian; 2 Asian American; 3. African American; 4. White; 5. Hispanic; Miss: Missing

Table A.9 2010 MSA-Mathematics Population and Stratified Random Sampling (S.R.S): Grade 5 LEA

Gender	Operational Form A				Operational Form F			
	2010 Pop. %	2010 S.R.S.	% of 2010 S.R.S	% of Differ.	2010 Pop. %	2010 S.R.S.	% of 2010 S.R.S	% of Differ.
1	50.25	1499	50.62	-0.37	51.36	1581	53.39	-2.04
2	49.54	1458	49.24	0.30	48.46	1372	46.34	2.12
Miss	0.21	4	0.14	0.07	0.19	8	0.27	-0.08
Total	100.0	2961	100.0	0.00	100.0	2961	100.0	0.00

Note. 1. Male; 2. Female; Miss: Missing