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**TO:** Members of the State Board of Education  
**FROM:** Karen B. Salmon, Ph.D. *KBS*  
**DATE:** October 25, 2016  
**SUBJECT:** Mode effect of paper administration of 2016 PARCC tests for ELA and Mathematics  
**INFORMATION**

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**PURPOSE:**

The purpose of this report is to provide the Board preliminary information regarding the mode effect of paper versus online administration of the PARCC assessments in 2016.

**FINDING:**

Statistical analysis was done with a matched-sample design for paper and online student pairs by grade and by subject. Using effect size analysis, a statistically significant difference was found to exist for six tests: four in ELA for grades 5, 6, 10, and 11; and two in mathematics for Algebra II and Geometry. Effect size is considered negligible for values  $< 0.1$  and small for values  $< 0.2$ . Effect size values above 0.2 suggest a statistical difference.

**BACKGROUND/PERSPECTIVE:**

From their inception, PARCC assessments were intended to be administered online. The purpose was both practical and educational. Practically, online tests provide an economy of administration and time for scoring and reporting. Educationally, online testing allows for the rich platform for relevant and realistic problems and prompt scenarios, and encourages the use of 21<sup>st</sup> Century tools for both classroom instruction and assessment. Technology based environments are also consistent with the goals to have every student ready for college and the workplace. That said, some levels of technical inequity are still a (shrinking) reality in some schools. Paper forms of the tests were developed to accommodate our schools' continued transition to routine, consistent use of technology for learning.

**ADDITIONAL INFORMATION:**

This is a preliminary report on the overall score. A more in-depth analysis is being conducted at the item/item-response level, but is not yet available. A rigorous equating process was used to determine the comparability of test items across platforms. While there is consistency of difficulty and task demand across paired items, (no evidence of disparate performance), a deeper analysis is being done to determine if there is a cumulative effect within question types.

TestCode	Maryland_N	Maryland_Avg	Maryland_SD	Maryland_Avg_Adj	Paper Score	Effect Size
	Match Sample Size	Paper	Standard Deviation	Adjustment to Online	Mean Adjustment	
ELA04	2,843	749	35	745	-4	0.11
ELA05	2,846	751	31	744	-6	0.21
ELA06	5,594	746	31	738	-8	0.27
ELA07	5,561	743	37	739	-4	0.11
ELA08	5,773	741	38	738	-3	0.08
ELA09	31	691	34	689	-3	0.08
ELA10	4,868	756	44	747	-9	0.21
ELA11	2,094	756	38	742	-14	0.36
MAT04	2,847	743	33	743	0	0.01
MAT05	2,761	742	31	744	2	0.06
MAT06	3,979	740	30	740	0	0.01
MAT07	2,992	731	25	730	-2	0.06
MAT08	2,009	722	38	718	-4	0.11
ALG01	4,520	745	35	738	-7	0.19
ALG02	2,740	747	34	737	-10	0.29
GEO01	977	753	28	745	-8	0.27

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**TO:** Members of the State Board of Education  
**FROM:** Karen B. Salmon, Ph.D. *KBS/clw*  
**DATE:** October 25, 2016  
**SUBJECT:** Distribution of 2016 PARCC Home Reports  
**INFORMATION**

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**PURPOSE:**

The purpose of this report is in response to the Board's request regarding when each of the school systems released individual reports to parents regarding their child's performance on the 2016 PARCC assessments.

**FINDING:**

The earliest release date was September 2 by ten of the LEAs. Eight additional systems released reports later in September. The remaining systems released reports in October, with the last scheduled for release October 28.

**BACKGROUND/PERSPECTIVE:**

Following the PARCC administration, in addition to scoring the assessments, the assessment vendor is responsible for the reporting of the student results. The local school systems specify where the reports are to be delivered and when the reports are to be sent to homes. The vendor produced the reports and forwarded to the location(s) identified by the local school systems August 10 - August 25, 2016. Some systems preferred the reports to be forwarded to the central offices while others wished for the reports to be shipped directly to schools. Districts and/or schools then reviewed the reports and notified the state if there were any needed reprints. The dates for dissemination of the ISRs were set by the LEAs.

**ADDITIONAL INFORMATION:**

Please see the attached table.

PARCC Assessments 2016

Individual Student Reports

<b>Local School System</b>	<b>Date of distribution</b>
Allegany	10/7/2016
Anne Arundel	9/26/2016
Baltimore	10/7/2016
Calvert	10/3/2016
Caroline	9/13/2016
Carroll	9/2/2016
Cecil	9/29/2016
Charles	10/3/2016
Dorchester	9/3/2016
Frederick	9/2/2016
Garrett	9/2/2016
Harford	10/14/2016
Howard	9/9/2016
Kent	9/2/2016
Montgomery	9/23/2016
Prince George's	10/28/2016
Queen Anne's	9/2/2016
St. Mary's	9/2/2016
Somerset	9/2/2016
Talbot	9/2/2016
Washington	9/27/2016
Wicomico	9/2/2016
Worcester	9/6/2016
Baltimore City	9/18/2016
Seed School	9/18/2016



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**TO:** Members of the Maryland State Board of Education  
**FROM:** Karen B. Salmon, Ph.D. *KBS/cln*  
**DATE:** October 25, 2016  
**SUBJECT:** UPDATE Maryland 2015-2016 PARCC Assessment – State-level Grades 3-8 and High School

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**PURPOSE:**

This memorandum provides additional information, for the State Board only, regarding the 2016 PARCC assessment results, as requested by the State Board, at the September 27, 2016 meeting.

**BACKGROUND:**

State level 2016 PARCC performance data were presented at the September 27, 2016 State Board meeting. The presentation included comparisons of 2015 and 2016 PARCC performance results and an additional review of the performance of Maryland’s middle school students taking end-of-course assessments in Algebra I, Algebra II, and Geometry. The State Board inquired about the Student Growth Percentile (SGP) data which is new for the 2016 PARCC administration.

**EXECUTIVE SUMMARY:**

To examine whether there was meaningful change in performance between the two years of PARCC assessments, tests of statistical significance were used to examine changes in PARCC performance levels between 2015 and 2016.

The performance of middle school students (grades 6 through 8) taking end-of-course assessments in Algebra I, Algebra II, and Geometry was further analyzed to examine the distribution and performance of students taking these assessments by local school system and by student group.

Results on SGP, by local school system, for the 2016 PARCC administration, are attached.

**ACTION:**

For information only

**PARCC performance on end of course assessments (Algebra I, Algebra II and geometry) among middle school students (grades 6-8)**

The following tables present

- The state-wide distribution (by LEA) of middle school students taking end of course assessments (Table 1)
- The performance of middle school students taking end of course assessments by LEA (Tables 2 – 3)
- The percentage of middle school students taking end of course assessments by student group (Tables 4 & 5)
- The performance of middle school students taking end of course assessments by student group (Tables 6 – 9)

**Table 1. Number and Percentage of middle school students taking end of course assessments by LEA**

	Algebra I, Algebra II or Geometry N = 28,200	Algebra I N = 25,638	Algebra II N = 67	Geometry N = 2,495
Allegany	194(1%)	193(1%)	*	*
Anne Arundel	2668(9%)	2576(10%)	24(36%)	68(3%)
Baltimore County	5506(20%)	5506(22%)	*	*
Calvert	622(2%)	288(1%)	*	334(13%)
Caroline	53(0%)	53(0%)	*	*
Carroll	398(1%)	398(2%)	*	*
Cecil	350(1%)	348(1%)	*	*
Charles	599(2%)	599(2%)	*	*
Dorchester	80(0%)	80(0%)	*	*
Frederick	512(2%)	504(2%)	*	*
Garrett	80(0%)	80(0%)	*	*
Harford	2209(8%)	1534(6%)	*	674(27%)
Howard	4141(15%)	2889(11%)	37(55%)	1215(49%)
Kent	27(0%)	27(0%)	*	*
Montgomery	7093(25%)	7093(28%)	*	*
Prince George's	1387(5%)	1240(5%)	*	146(6%)
Queen Anne's	197(1%)	197(1%)	*	*
Saint Mary's	453(2%)	406(2%)	*	47(2%)
Somerset	*	*	*	*
Talbot	89(0%)	89(0%)	*	*
Washington	738(3%)	738(3%)	*	*
Wicomico	184(1%)	182(1%)	*	*
Worcester	124(0%)	122(0%)	*	*
Baltimore City	484(2%)	484(2%)	*	*

**Table 2. Middle school performance in Algebra I, Algebra II, or geometry by LEA**

	Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Performance Level 5
Allegheny(n=194)	*	*	27(14%)	140(72%)	19(10%)
Anne Arundel(n=2668)	18(1%)	105(4%)	479(18%)	1871(70%)	195(7%)
Baltimore County(n=5506)	436(8%)	1288(23%)	1789(32%)	1919(35%)	74(1%)
Calvert(n=622)	*	42(7%)	256(41%)	302(49%)	16(3%)
Caroline(n=53)	*	*	*	46(87%)	*
Carroll(n=398)	*	*	*	269(68%)	124(31%)
Cecil(n=350)	*	16(5%)	51(15%)	264(75%)	18(5%)
Charles(n=599)	*	16(3%)	105(18%)	431(72%)	41(7%)
Dorchester(n=80)	*	10(12%)	32(40%)	36(45%)	*
Frederick(n=512)	*	*	13(3%)	333(65%)	164(32%)
Garrett(n=80)	*	*	*	70(88%)	*
Harford(n=2209)	13(1%)	63(3%)	311(14%)	1552(70%)	270(12%)
Howard(n=4141)	43(1%)	156(4%)	614(15%)	2740(66%)	588(14%)
Kent(n=27)	*	*	*	19(70%)	*
Montgomery(n=7093)	277(4%)	734(10%)	1465(21%)	4225(60%)	392(6%)
Prince George's(n=1387)	26(2%)	111(8%)	424(31%)	788(57%)	38(3%)
Queen Anne's(n=197)	*	*	14(7%)	161(82%)	21(11%)
Saint Mary's(n=453)	*	*	44(10%)	363(80%)	40(9%)
Somerset(n=0)	*	*	*	*	*
Talbot(n=89)	*	*	13(15%)	74(83%)	*
Washington(n=738)	15(2%)	56(8%)	173(23%)	450(61%)	44(6%)
Wicomico(n=184)	*	*	20(11%)	139(76%)	24(13%)
Worcester(n=124)	*	*	*	98(79%)	16(13%)
Baltimore City(n=484)	37(8%)	112(23%)	122(25%)	184(38%)	29(6%)
State	884(3%)	2736(10%)	5980(21%)	16476(58%)	2124(8%)

**Table 3. Middle school performance in Algebra I by LEA**

	Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Performance Level 5
Allegany(n=193)	*	*	27(14%)	140(73%)	18(9%)
Anne Arundel(n=2576)	16(1%)	92(4%)	454(18%)	1827(71%)	187(7%)
Baltimore County(n=5506)	436(8%)	1288(23%)	1789(32%)	1919(35%)	74(1%)
Calvert(n=288)	*	26(9%)	133(46%)	123(43%)	*
Caroline(n=53)	*	*	*	46(87%)	*
Carroll(n=398)	*	*	*	269(68%)	124(31%)
Cecil(n=348)	*	16(5%)	50(14%)	263(76%)	18(5%)
Charles(n=599)	*	16(3%)	105(18%)	431(72%)	41(7%)
Dorchester(n=80)	*	10(12%)	32(40%)	36(45%)	*
Frederick(n=504)	*	*	11(2%)	331(66%)	161(32%)
Garrett(n=80)	*	*	*	70(88%)	*
Harford(n=1534)	13(1%)	59(4%)	208(14%)	1109(72%)	145(9%)
Howard(n=2889)	41(1%)	145(5%)	474(16%)	1989(69%)	240(8%)
Kent(n=27)	*	*	*	19(70%)	*
Montgomery(n=7093)	277(4%)	734(10%)	1465(21%)	4225(60%)	392(6%)
Prince George's(n=1240)	26(2%)	105(8%)	373(30%)	708(57%)	28(2%)
Queen Anne's(n=197)	*	*	14(7%)	161(82%)	21(11%)
Saint Mary's(n=406)	*	*	41(10%)	330(81%)	29(7%)
Somerset(n=0)	*	*	*	*	*
Talbot(n=89)	*	*	13(15%)	74(83%)	*
Washington(n=738)	15(2%)	56(8%)	173(23%)	450(61%)	44(6%)
Wicomico(n=182)	*	*	19(10%)	138(76%)	24(13%)
Worcester(n=122)	*	*	*	98(80%)	16(13%)
Baltimore City(n=484)	37(8%)	112(23%)	122(25%)	184(38%)	29(6%)
State	880(3%)	2685(10%)	5529(22%)	14942(58%)	1602(6%)



**Table 4. Number and Percentage of middle school students taking end of course assessments by Race**

	Algebra I, Algebra II or Geometry N = 28,200	Algebra I N = 25,638	Algebra II N = 67	Geometry N = 2,495
American Indian/Al	81(0%)	76(0%)	*	*
Asian	3754(13%)	3183(12%)	32(48%)	539(22%)
Black/African American	5945(21%)	5617(22%)	*	319(13%)
Hispanic	2836(10%)	2720(11%)	*	115(5%)
Native Hawaiian/PI	33(0%)	31(0%)	*	*
White	14347(51%)	12874(50%)	24(36%)	1449(58%)
2+ Races	1204(4%)	1137(4%)	*	66(3%)

Note: Of the students taking each assessment, # (%) of students of each Race

**Table 5. Number and Percentage of middle school students taking end of course assessments by student group**

	Algebra I, Algebra II or Geometry N = 28,200	Algebra I N = 25,638	Algebra II N = 67	Geometry N = 2,495
Special Education	559(2%)	543(2%)	*	15(1%)
Limited English Proficiency	380(1%)	379(1%)	*	*
Free Reduced Meals	6608(23%)	6401(25%)	*	199(8%)

Note: Of the students taking each assessment, # (%) of students that are SPED/LEP/FARMS

**Table 6. Middle school performance in Algebra I, Algebra II, or Geometry by Race**

	Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Performance Level 5
American Indian/Al(n=81)	*	*	19(23%)	50(62%)	*
Asian(n=3754)	30(1%)	131(3%)	461(12%)	2469(66%)	663(18%)
Black/African American(n=5945)	420(7%)	1196(20%)	1912(32%)	2350(40%)	67(1%)
Hispanic(n=2836)	194(7%)	505(18%)	860(30%)	1214(43%)	63(2%)
Native Hawaiian/PI(n=33)	*	*	*	19(58%)	*
White(n=14347)	198(1%)	776(5%)	2461(17%)	9661(67%)	1251(9%)
2+ Races(n=1204)	38(3%)	120(10%)	258(21%)	713(59%)	75(6%)

Note: Among the students in each Race, # (%) of students who scored each performance level in Algebra I, Algebra II or Geometry

**Table 7. Middle school performance in Algebra I, Algebra II, or Geometry by student group**

	Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Performance Level 5
Special Education (n =559 )	81(14%)	142(25%)	126(23%)	180(32%)	30(5%)
Limited English Proficiency (n = 380)	88(23%)	123(32%)	63(17%)	87(23%)	19(5%)
Free Reduced Meals (n =6608 )	546(8%)	1430(22%)	2087(32%)	2448(37%)	97(1%)

Note: Among the students who are SPED/LEP/FARMS, # (%) of students who scored each performance level in Algebra I, Algebra II or Geometry

**Table 8. Middle school performance in Algebra I by Race**

	Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Performance Level 5
American Indian/Al(n=76)	*	*	17(22%)	47(62%)	*
Asian(n=3183)	28(1%)	131(4%)	417(13%)	2161(68%)	446(14%)
Black/African American(n=5617)	418(7%)	1185(21%)	1785(32%)	2175(39%)	54(1%)
Hispanic(n=2720)	194(7%)	501(18%)	833(31%)	1143(42%)	49(2%)
Native Hawaiian/PI(n=31)	*	*	*	19(61%)	*
White(n=12874)	198(2%)	742(6%)	2226(17%)	8726(68%)	982(8%)
2+ Races(n=1137)	38(3%)	118(10%)	243(21%)	671(59%)	67(6%)

Note: Among the students in each Race, # (%) of students who scored each performance level in Algebra I

**Table 9. Middle school performance in Algebra I by Student Group**

	Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Performance Level 5
Special Education (n =543 )	81(15%)	141(26%)	122(22%)	172(32%)	27(5%)
Limited English Proficiency (n =379 )	88(23%)	123(32%)	63(17%)	86(23%)	19(5%)
Free Reduced Meals (n =6401 )	545(9%)	1420(22%)	2019(32%)	2335(36%)	82(1%)

Note: Among the students who are SPED/LEP/FARMS, # (%) of students who scored each performance level in Algebra I

# Student Academic Growth: Student Growth Percentiles (SGP): Mathematics

	Math 04		Math 05		Math 06		Math 07		Math 08	
	N	Median	N	Median	N	Median	N	Median	N	Median
State	62517	50	61372	50	59690	50	50489	50	34474	50
Allegany County	599	64	569	51	617	51	588	49	400	68
Anne Arundel County	5770	43	5639	51	5513	41	5454	52	2941	49
Baltimore County	8251	55	8165	58	7458	47	5506	43	2223	40
Calvert County	1054	49	1065	52	1117	52	1212	56	634	57
Caroline County	402	66	407	57	381	58	379	66	362	56
Carroll County	1759	57	1829	59	1889	53	1932	47	1593	63
Cecil County	1061	38	1102	36.5	1026	58	1049	45	754	51
Charles County	1775	54	1790	46	1753	54	1801	51	1310	47
Dorchester County	350	60	309	46	340	25.5	315	66	197	40
Frederick County	2986	53	2930	57	2829	52	2885	51	2353	60
Garrett County	263	38	281	51	284	58	277	57	177	49
Harford County	2741	43	2678	43	2720	52	1990	49	1329	55
Howard County	3908	60	3884	49	3999	59	2627	54	1369	51
Kent County	162	51.5	132	57	140	34	144	62	111	61
Montgomery County	11128	63	10953	56	10765	60	8579	57	3654	51
Prince George's County	8989	43	8715	41	8374	45	5843	42	7146	47
Queen Anne's County	578	47	564	59	585	66	569	58	415	63
Saint Mary's County	1235	46	1266	46	1109	59	785	51	823	55
Somerset County	208	49	183	53	190	55	198	40	172	32
Talbot County	328	51.5	306	59	308	37.5	309	63	245	47
Washington County	1629	42	1570	44	1544	49	1598	53	857	58
Wicomico County	1034	49	930	50	915	62	929	64	716	54
Worcester County	412	48.5	459	44	438	61	466	54	293	65
Baltimore City	5775	28	5487	42	5151	34	4769	42	4089	41

# Student Academic Growth Student Growth Percentiles (SGP): English Language Arts

	ELA 04		ELA 05		ELA 06		ELA 07		ELA 08	
	N	Median	N	Median	N	Median	N	Median	N	Median
State	62228	50	61094	50	59657	50	59148	50	58578	50
Allegany County	602	69	570	60	619	41	589	51	591	53
Anne Arundel County	5741	44	5629	53	5511	42	5495	55	5421	48
Baltimore County	8214	41	8112	39	7413	36	7457	36	7222	37
Calvert County	1052	56	1062	47	1116	55	1218	49	1241	48
Caroline County	402	52	407	51	382	42.5	378	58	413	55
Carroll County	1759	60	1825	54	1891	44	1936	54	1986	55
Cecil County	1062	48	1101	46	1025	49	1055	60	1094	51
Charles County	1775	60	1789	50	1753	56	1809	57	1871	59
Dorchester County	350	55	309	54	344	46	314	54.5	279	48
Frederick County	2979	45	2919	56	2825	50	2874	47	2830	62
Garrett County	263	55	281	52	284	43	277	41	253	33
Harford County	2735	46	2675	51	2715	58	2660	49	2805	43
Howard County	3899	60	3873	48	4006	55	4045	59	3962	58
Kent County	161	55	132	51	140	46	144	70	136	47
Montgomery County	11048	63	10867	60	10724	53	10502	52	10414	51
Prince George's County	8911	48	8660	47	8412	59	8075	56	8059	51
Queen Anne's County	577	53	567	62	587	63	568	76	607	66
Saint Mary's County	1233	51	1265	49	1158	53	1206	56	1210	54
Somerset County	208	60	183	50	188	65.5	197	65	173	67
Talbot County	326	61.5	302	66.5	305	40	310	63	334	52.5
Washington County	1623	61	1567	51	1538	55	1601	59	1579	58
Wicomico County	1035	63	929	48	910	54	927	59	885	47
Worcester County	411	69	458	44	437	76	470	56	411	74
Baltimore City	5741	27	5464	42	5131	47	4752	29	4485	45

