

**APPENDIX A**

**COMPARISON OF  
COMMON AND EQUATING ITEM SETS**

The tables in appendix A compare the following information, by subject area, for the common and equating item sets that appeared in the 2009 MCAS standard tests:

I. Number of Each Item Type and Number of Points Possible .....	3
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## I. Number of Each Item Type and Number of Points Possible

### Key for Tables A-1 through A-3:

MC = multiple-choice items, each with a total of 1 point possible  
 SA = short-answer items, each with a total of 1 point possible  
 OR = open-response items, each with a total of 4 points possible  
 WP = writing prompts, each with a total of 20 points possible

**Table A-1. 2009 MCAS: English Language Arts  
 Common and Equating Item Set Comparison  
 Number of Items by Item Type  
 and Total Points Possible**

Grade	Common				Equating			
	MC	OR	WP	Total Points	MC	OR	WP	Total Points
3	40	2	0	<b>48</b>	32	4	0	<b>48</b>
4	36	4	1	<b>72</b>	36	6	0	<b>60</b>
5	36	4	0	<b>52</b>	36	6	0	<b>60</b>
6	36	4	0	<b>52</b>	36	6	0	<b>60</b>
7	36	4	1	<b>72</b>	36	6	0	<b>60</b>
8	36	4	0	<b>52</b>	36	6	0	<b>60</b>
10	36	4	1	<b>72</b>	48	8	0	<b>80</b>

\* Because grade 10 was pre-equated, the common items functioned as the equating link. A set of items in the grade 10 matrix is also available for equating if needed.

**Table A-2. 2009 MCAS: Mathematics  
 Common and Equating Item Set Comparison  
 Number of Items by Item Type  
 and Total Points Possible**

Grade	Common				Equating			
	MC	SA	OR	Total Points	MC	SA	OR	Total Points
3	25	5	5	<b>40</b>	25	5	5	<b>40</b>
4	29	5	5	<b>54</b>	29	5	5	<b>54</b>
5	29	5	5	<b>54</b>	29	5	5	<b>54</b>
6	29	5	5	<b>54</b>	29	5	5	<b>54</b>
7	29	5	5	<b>54</b>	29	5	5	<b>54</b>
8	29	5	5	<b>54</b>	29	5	5	<b>54</b>
10	32	4	6	<b>60</b>	32	4	6	<b>60</b>

\* Because grade 10 was pre-equated, the common items functioned as the equating link. A set of items in the grade 10 matrix is also available for equating if needed.

**Table A-3. 2009 MCAS: Science and Technology/Engineering  
 Common and Equating Item Set Comparison  
 Number of Items by Item Type  
 and Total Points Possible**

HSBio = High School Biology; HSPHys = High School Introductory Physics  
 HSChem = High School Chemistry; HSTech/Eng = High School Technology/Engineering

Grade and Test	Common			Equating		
	MC	OR	Total Points	MC	OR	Total Points
5	34	5	<b>54</b>	34	5	<b>54</b>
8	34	5	<b>54</b>	34	5	<b>54</b>
HSBio	40	5	<b>60</b>			
HSChem	40	5	<b>60</b>			
HSPHys	40	5	<b>60</b>			
HSTech/Eng	40	5	<b>60</b>			

\* Because grade 10 was pre-equated, the common items functioned as the equating link.

## II. Reporting Category Point Distribution

**Table A-4. 2009 MCAS: English Language Arts  
Common (C) and Equating (E) Item Set Comparison  
Reporting Category Point Distribution**

Reporting Category	Grade													
	3		4		5		6		7		8		10	
	C	E	C	E	C	E	C	E	C	E	C	E	C	E*
<b>Language</b>	7	4	4	7	6	5	7	4	4	5	6	6	5	7
<b>Literature</b>	41	44	48	53	46	55	45	56	48	55	46	54	47	73
<b>Composition</b>			20						20				40	
<b>TOTAL</b>	<b>48</b>	<b>48</b>	<b>72</b>	<b>60</b>	<b>52</b>	<b>60</b>	<b>52</b>	<b>60</b>	<b>72</b>	<b>60</b>	<b>52</b>	<b>60</b>	<b>72</b>	<b>80</b>

\* Because grade 10 was pre-equated, the common items functioned as the equating link. A set of items in the grade 10 matrix is also available for equating if needed.

**Table A-5. 2009 MCAS: Mathematics  
Common (C) and Equating (E) Item Set Comparison  
Reporting Category Point Distribution**

Reporting Category*	Grade													
	3		4		5		6		7		8		10	
	C	E	C	E	C	E	C	E	C	E	C	E	C	E†
<b>NS&amp;O</b>	14	14	19	19	18	14	18	18	14	14	14	12	11	11
<b>PR&amp;A</b>	8	8	11	11	14	14	14	14	15	15	15	14	19	19
<b>Geo</b>	5	5	7	6	7	11	7	7	7	7	7	7	9	10
<b>Meas</b>	5	5	6	7	7	7	7	7	7	7	7	10	9	9
<b>DataAn</b>	8	8	11	11	8	8	8	8	11	11	11	11	12	11
<b>TOTAL</b>	<b>40</b>	<b>40</b>	<b>54</b>	<b>54</b>	<b>54</b>	<b>54</b>	<b>54</b>	<b>54</b>	<b>54</b>	<b>54</b>	<b>54</b>	<b>54</b>	<b>60</b>	<b>60</b>

\* NS&O = Number Sense and Operations; PR&A = Patterns, Relations, and Algebra; Geo = Geometry; Meas = Measurement; DataAn = Data Analysis, Statistics, and Probability

† Because grade 10 was pre-equated, the common items functioned as the equating link. A set of items in the grade 10 matrix is also available for equating if needed.

**Table A-6. 2009 MCAS: Science and Technology/Engineering,  
Grades 5 and 8 Common and Equating Item Set  
Comparison Reporting Category Point Distribution**

Reporting Category	Grade			
	5		8	
	Common	Equating	Common	Equating
<b>Earth and Space Science</b>	15	16	13	14
<b>Life Science</b>	17	16	14	14
<b>Physical Sciences</b>	13	15	14	13
<b>Technology/Engineering</b>	9	7	13	13
<b>TOTAL</b>	<b>54</b>	<b>54</b>	<b>54</b>	<b>54</b>

**Table A-7. 2009 MCAS: High School  
Science and Technology/Engineering, (Grades 9–11)  
Common and Equating Item Set Comparison  
Reporting Category Point Distribution**

<i>Biology</i>		
<i>Reporting Category*</i>	<i>Common</i>	<i>Equating†</i>
Bio&Cell	15	
Genetics	12	
Ana&Phys	9	
Ev&Bio	11	
Ecology	13	
<b>Total</b>	<b>60</b>	

\* Bio&Cell = Biochemistry and Cell Biology  
 Ana&Phys = Anatomy and Physiology  
 Ev&Bio = Evolution and Biodiversity  
 † Because high school tests were pre-equated, the common items functioned as the equating link.

<i>Chemistry</i>		
<i>Reporting Category*</i>	<i>Common</i>	<i>Equating†</i>
PM&T	15	
AS&P	15	
B&R	18	
SE&A	12	
<b>Total</b>	<b>60</b>	

\* PM&T = Properties of Matter and Thermochemistry  
 AS&P = Atomic Structure and Periodicity  
 B&R = Bonding and Reactions  
 SE&A = Solutions, Equilibrium, and Acid Base Theory  
 † Because high school tests were pre-equated, the common items functioned as the equating link.

<i>Introductory Physics</i>		
<i>Reporting Category*</i>	<i>Common</i>	<i>Equating†</i>
M&F	24	
H&HT	9	
W&R	15	
Electr	12	
<b>Total</b>	<b>60</b>	

\* M&F = Motion and Forces  
 H&HT = Heat and Heat Transfer  
 W&R = Waves and Radiation  
 Electr = Electromagnetism  
 † Because high school tests were pre-equated, the common items functioned as the equating link.

<i>Technology/Engineering</i>		
<i>Reporting Category*</i>	<i>Common</i>	<i>Equating†</i>
EngDes	12	
C&M	12	
F&ST	18	
E&CS	18	
<b>Total</b>	<b>60</b>	

\* EngDes = Engineering Design  
 C&M = Construction and Manufacturing  
 F&ST = Fluid and Thermal Systems  
 E&CS = Electrical and Communication Systems  
 † Because high school tests were pre-equated, the common items functioned as the equating link.

## III. Difficulty and Discrimination

**Table A-8. 2009 MCAS: English Language Arts  
Common and Equating Item Set Comparison  
Difficulty (*p*-value or Mean Points Scored) and Discrimination (*D*)**

Grade	Common						Equating					
	MC		OR		WP		MC		OR		WP	
	<i>p</i> -value	<i>D</i>	Mean	<i>D</i>	Mean	<i>D</i>	<i>p</i> -value	<i>D</i>	Mean	<i>D</i>	Mean	<i>D</i>
3	0.78	0.42	1.53	0.50			0.79	0.42	2.15	0.55		
4	0.79	0.38	1.93	0.58	12.46	0.57	0.77	0.41	2.04	0.60		
5	0.81	0.40	2.09	0.51			0.76	0.41	2.23	0.56		
6	0.81	0.38	2.26	0.58			0.73	0.42	2.34	0.62		
7	0.79	0.36	2.40	0.61	13.42	0.63	0.77	0.39	2.33	0.67		
8	0.80	0.42	2.37	0.59			0.77	0.42	2.50	0.65		
10 <sup>†</sup>	0.80	0.35	2.63	0.63	14.65	0.64	0.73	0.42	2.51	0.68		

<sup>†</sup> Because high school tests were pre-equated, the common items functioned as the equating link. A set of items in the grade 10 matrix is also available for equating if needed.

**Table A-9. 2009 MCAS: Mathematics  
Common and Equating Item Set Comparison  
Difficulty (*p*-value or Mean Points Scored) and Discrimination (*D*)**

Grade	Common						Equating					
	MC		SA		OR		MC		SA		OR	
	<i>p</i> -value	<i>D</i>	<i>p</i> -value	<i>D</i>	Mean	<i>D</i>	<i>p</i> -value	<i>D</i>	<i>p</i> -value	<i>D</i>	Mean	<i>D</i>
3	0.78	0.42	0.82	0.37	1.26	0.52	0.79	0.43	0.71	0.42	1.58	0.52
4	0.73	0.39	0.60	0.46	2.82	0.57	0.76	0.42	0.72	0.42	2.62	0.61
5	0.71	0.44	0.69	0.47	2.69	0.64	0.76	0.44	0.67	0.48	2.15	0.64
6	0.76	0.43	0.63	0.49	2.56	0.67	0.77	0.46	0.73	0.45	2.57	0.65
7	0.72	0.45	0.74	0.49	2.47	0.70	0.72	0.47	0.66	0.52	2.44	0.67
8	0.71	0.44	0.69	0.52	2.10	0.70	0.61	0.45	0.59	0.50	2.29	0.73
10 <sup>†</sup>	0.61	0.43	0.74	0.45	2.46	0.71	0.54	0.42	0.51	0.57	2.08	0.74

<sup>†</sup> Because high school tests were pre-equated, the common items functioned as the equating link. A set of items in the grade 10 matrix is also available for equating if needed.

**Table A-10. 2009 MCAS: Science and Technology/Engineering  
Common and Equating Item Set Comparison  
Difficulty (*p*-value or Mean Points Scored) and Discrimination (*D*)**

Grade/ Test	Common				Equating <sup>†</sup>			
	MC		OR		MC		OR	
	<i>p</i> -value	<i>D</i>	Mean	<i>D</i>	<i>p</i> -value	<i>D</i>	Mean	<i>D</i>
5	0.72	0.33	2.01	0.51	0.74	0.36	2.07	0.48
8	0.66	0.35	1.90	0.54	0.67	0.38	2.20	0.64
HSBio	0.66	0.40	1.83	0.64				
HSCChem	0.57	0.42	1.84	0.69				
HSPHys	0.62	0.38	1.85	0.68				
HSTech/Eng	0.65	0.30	1.96	0.53				

<sup>†</sup> Because high school tests were pre-equated, the common items functioned as the equating link.