

APPENDIX M

COMPARISON OF COMMON AND EQUATING ITEM SETS

A. Number of Each Item Type and Number of Points Possible

Key for tables M1 through M3:

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 M1: 2007 MCAS English Language Arts
Common and Equating Item Set Comparison
Number of Items by Item Type
and Total Possible Points**

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

* Each grade 10 equating item appears on two forms.

**Table M2: 2007 MCAS Mathematics
Common and Equating Item Set Comparison
Number of Items by Item Type
and Total Possible Points**

Grade	Common				Equating			
	MC	SA	OR	Total Points	MC	SA	OR	Total Points
3	25	5	5	40	25	5	5	40
4	29	5	5	54	29	5	5	54
5	29	5	5	54	29	5	5	54
6	29	5	5	54	29	5	5	54
7	29	5	5	54	29	5	5	54
8	29	5	5	54	29	5	5	54
10**	32	4	6	60	64*	8*	12*	60

* Each grade 10 equating item appears on two forms.

** Grade 10 Retest forms consists of common items only.

**Table M3: 2007 MCAS Science and Technology/Engineering
Common and Equating Item Set Comparison
Number of Items by Item Type
and Total Possible Points**

HSBio = High School Biology / HSPHys = High School Introductory Physics

HSCChem = 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	54	34	5	54
8	34	5	54	34	5	54
HSBio	40	5	60	40	5	60
HSCChem	40	5	60	40	5	60
HSPHys	40	5	60	40	5	60
HSTech/Eng	40	5	60	39*	3*	51*

* The High School Technology/Engineering equating model was a hybrid model that used both common items (18 MC + 2 OR) and unique matrix items (21 MC + 1 OR) as equating items, for a total of 51 points (39 MC and 3 OR).

Appendix M

B. Reporting Category Point Distribution

**Table M4: 2007 MCAS English Language Arts
Common and Equating 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
Language	6	4	7	8	5	4	5	2	5	6	5	6	6	8
Literature	42	44	45	52	47	56	47	58	47	54	47	54	46	72
Composition	0	0	20	0	0	0	0	0	20	0	0	0	20	0
TOTAL	48	48	72	60	52	60	52	60	72	60	52	60	72	80

**Table M5: 2007 MCAS Mathematics
Common and Equating 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
NS&O	14	13	19	18	19	18	19	18	14	14	14	10	10	11
PR&A	8	7	11	12	12	14	13	14	15	15	15	14	18	18
Geo	5	5	7	7	8	7	8	7	7	7	7	8	9	10
Meas	5	7	6	7	7	7	7	7	7	7	7	10	10	7
DataAn	8	8	11	10	8	8	7	8	11	11	11	12	13	14
TOTAL	40	40	54	54	54	54	54	54	54	54	54	54	60	60

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

**Table M6: 2007 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
Earth and Space Science	14	15	14	13
Life Science	13	13	14	14
Physical Sciences	14	14	13	14
Technology/Engineering	13	12	13	13
Total	54	54	54	54

**Table M7: 2007 MCAS Science and Technology/Engineering, High School Tests
Common and Equating Item Set Comparison
Reporting Category Point Distribution**

Biology		
Reporting Category*	Common	Equating
Bio&Cell	15	15
Genetics	12	12
Ana&Phys	9	9
Ev&Bio	12	12
Ecology	12	12
Total	60	60

* Bio&Cell = Biochemistry and Cell Biology
 Ana&Phys = Anatomy and Physiology
 Ev&Bio = Evolution and Biodiversity

Chemistry		
Reporting Category**	Common	Equating
PM&T	15	15
AS&P	15	15
B&R	19	18
SE&A	11	12
Total	60	60

** 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

Introductory Physics		
Reporting Category***	Common	Equating
M&F	24	24
H&HT	9	10
W&R	15	15
Electr	12	11
Total	60	60

*** M&F = Motion and Forces
 H&HT = Heat and Heat Transfer
 W&R = Waves and Radiation
 Electr = Electromagnetism

Technology/Engineering		
Reporting Category****	Common	Equating
EngDes	12/60=20%	10/51=20%
C&M	14/60=23%	11/51=22%
F&ST	16/60=27%	15/51=29%
E&CS	18/60=30%	15/51=29%
Total	60	51

**** EngDes = Engineering Design
 C&M = Construction and Manufacturing
 F&ST = Fluid and Thermal Systems
 E&CS = Electrical and Communications Systems

Appendix M

C. Difficulty and Discrimination

**Table M8: 2007 MCAS English Language Arts
Common and Equating Item Set Comparison
Difficulty (p-value or mean points scored) and Discrimination (D)**

Grade	Common Item Type						Equating Item Type					
	MC		OR		WP		MC		OR		WP	
	p-value	D	mean	D	mean	D	p-value	D	mean	D	mean	D
3	0.80	0.43	2.29	0.52	N/A	N/A	0.79	0.45	2.31	0.55	N/A	N/A
4	0.81	0.40	1.98	0.53	14.00	0.58	0.77	0.43	2.06	0.55	N/A	N/A
5	0.78	0.40	2.18	0.59	N/A	N/A	0.76	0.41	2.20	0.56	N/A	N/A
6	0.79	0.39	2.16	0.56	N/A	N/A	0.72	0.41	2.19	0.60	N/A	N/A
7	0.81	0.41	2.25	0.61	13.37	0.57	0.75	0.41	2.06	0.62	N/A	N/A
8	0.79	0.41	2.31	0.60	N/A	N/A	0.76	0.43	2.37	0.65	N/A	N/A
10	0.78	0.40	2.28	0.60	14.83	0.67	0.72	0.35	2.40	0.56	N/A	N/A

**Table M9: 2007 MCAS Mathematics
Common and Equating Item Set Comparison
Difficulty (p-value or mean points scored) and Discrimination (D)**

Grade	Common Item Type						Equating Item Type					
	MC		SA		OR		MC		SA		OR	
	p-value	D	p-value	D	mean	D	p-value	D	p-value	D	mean	D
3	0.77	0.42	0.76	0.41	1.33	0.45	0.78	0.43	0.70	0.47	1.59	0.49
4	0.74	0.40	0.71	0.42	2.58	0.57	0.68	0.40	0.69	0.43	2.32	0.59
5	0.72	0.44	0.67	0.43	2.68	0.60	0.73	0.42	0.65	0.48	2.14	0.64
6	0.71	0.46	0.50	0.43	2.67	0.64	0.75	0.45	0.72	0.41	2.21	0.65
7	0.66	0.44	0.68	0.52	2.49	0.68	0.67	0.47	0.69	0.49	2.22	0.69
8	0.66	0.46	0.58	0.54	2.25	0.68	0.61	0.45	0.54	0.52	2.16	0.70
10	0.69	0.42	0.74	0.46	2.45	0.74	0.51	0.36	0.42	0.46	2.05	0.64

**Table M10: 2007 MCAS Science and Technology/Engineering
Common and Equating Item Set Comparison
Difficulty (p-value or mean points scored) and Discrimination (D)**

Grade/ Test	Common Item Type				Equating Item Type			
	MC		OR		MC		OR	
	p-value	D	mean	D	p-value	D	mean	D
5	0.73	0.31	1.96	0.51	0.74	0.35	2.16	0.47
8	0.65	0.35	1.93	0.64	0.65	0.39	1.98	0.61
HSBio	0.59	0.40	1.66	0.66	0.60	0.40	1.68	0.66
HSCChem	0.57	0.39	1.53	0.70	0.57	0.42	1.62	0.65
HSPHys	0.58	0.42	1.97	0.69	0.61	0.41	1.85	0.61
HSTech/Eng	0.59	0.32	1.87	0.57	0.61	0.32	2.00	0.56