Appendix 13D: TIMSS 2015 Eighth Grade Science Item Parameters from Concurrent Calibration

TIMSS 2015 Eighth Grade Science Item Parameters from Concurrent Calibration

Item		Slope (a_j)	Location (b_j)	Guessing (c_j)	Step 1 (d_{j1})	Step 2 (d_{j2})
Items Released in 2011:						
S01_01	S032611	1.027 (0.141)	1.240 (0.069)	0.229 (0.020)		
S01_02	S032614	0.805 (0.039)	-0.155 (0.036)			
S01_03	S032451	0.637 (0.019)	0.012 (0.025)		-1.232 (0.072)	1.232 (0.071)
S01_04	S032156	1.160 (0.120)	0.722 (0.055)	0.259 (0.022)		
S01_05	S032056	0.871 (0.043)	0.407 (0.033)			
S01_06	S032087	0.927 (0.099)	0.739 (0.065)	0.201 (0.025)		
S01_07	S032279	0.768 (0.117)	1.395 (0.094)	0.179 (0.024)		
S01_08	S032238	1.326 (0.118)	0.723 (0.043)	0.191 (0.018)		
S01_09	S032369	0.597 (0.024)	0.702 (0.032)		-0.297 (0.055)	0.297 (0.063)
S01_10	S032160	0.856 (0.097)	0.295 (0.102)	0.340 (0.035)		
S01_11	S032654	0.958 (0.093)	0.588 (0.064)	0.205 (0.025)		
S01_12	S032126	0.764 (0.038)	0.050 (0.036)			
S01_13	S032510	0.965 (0.086)	-0.069 (0.089)	0.295 (0.035)		
S01_14	S032158	0.949 (0.099)	0.268 (0.088)	0.329 (0.032)		
S02_01	S052093	0.579 (0.061)	-1.426 (0.272)	0.299 (0.078)		
S02_02	S052088	0.999 (0.080)	-0.156 (0.078)	0.237 (0.033)		
S02_03	S052030	0.821 (0.113)	0.944 (0.084)	0.268 (0.028)		
S02_04	S052080	0.665 (0.084)	0.255 (0.142)	0.303 (0.044)		
S02_05	S052091	0.834 (0.041)	0.169 (0.033)			
S02_06	S052152	1.500 (0.129)	0.781 (0.037)	0.169 (0.016)		
S02_07	S052136	0.830 (0.041)	0.157 (0.033)			
S02_08	S052046	1.585 (0.123)	-0.447 (0.061)	0.353 (0.032)		
S02_09	S052254	0.826 (0.112)	1.120 (0.078)	0.206 (0.025)		
S02_10	S052207	1.065 (0.051)	0.651 (0.031)			
S02_11A	S052165A	0.867 (0.054)	1.385 (0.065)			
S02_11B	S052165B	0.718 (0.044)	1.124 (0.060)			
S02_11C	S052165C	0.889 (0.047)	0.864 (0.041)			
S02_12	S052297	0.831 (0.087)	0.251 (0.097)	0.277 (0.035)		
S02_13	S052032	1.156 (0.062)	1.101 (0.040)			
S02_14	S052106	0.748 (0.045)	0.948 (0.052)			

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TIMSS 2015 Eighth Grade Science Item Parameters from Concurrent Calibration (Continued)

Item		Slope (a_j)	Location (b_j)	Guessing (c_j)	Step 1 (d_{j1})	Step 2 (d_{j2})
S03_01	S042304	0.769 (0.063)	-0.059 (0.086)	0.148 (0.033)		
S03_02	S042038	0.902 (0.080)	0.472 (0.063)	0.160 (0.026)		
S03_03	S042298	1.066 (0.051)	0.679 (0.032)			
S03_04	S042261	0.915 (0.049)	0.929 (0.043)			
S03_05A	S042051A	0.762 (0.038)	0.018 (0.036)			
S03_05B	S042051B	1.323 (0.061)	0.683 (0.027)			
S03_06	S042076	1.020 (0.049)	0.622 (0.032)			
S03_07	S042404	0.934 (0.042)	1.216 (0.035)		0.049 (0.038)	-0.049 (0.057)
S03_08	S042306	1.132 (0.141)	0.986 (0.060)	0.268 (0.021)		
S03_09	S042403	0.963 (0.049)	0.801 (0.037)			
S03_10	S042272	0.902 (0.088)	0.221 (0.085)	0.269 (0.033)		
S03_11	S042100	0.508 (0.023)	0.545 (0.036)		-0.051 (0.060)	0.051 (0.068)
S03_12A	S042238A	0.733 (0.082)	0.793 (0.078)	0.155 (0.028)		
S03_12B	S042238B	0.775 (0.047)	1.166 (0.060)			
S03_12C	S042238C	0.904 (0.043)	-0.600 (0.039)			
S03_13	S042141	0.792 (0.072)	-0.196 (0.110)	0.242 (0.041)		
S03_14	S042215	0.751 (0.167)	1.794 (0.163)	0.237 (0.025)		
S05_01	S032542	1.360 (0.137)	0.692 (0.049)	0.293 (0.020)		
S05_02	S032645	1.014 (0.121)	0.755 (0.070)	0.307 (0.025)		
S05_03Z	S032530Z	0.547 (0.023)	0.348 (0.035)		0.956 (0.054)	-0.956 (0.060)
S05_04	S032007	0.842 (0.041)	0.355 (0.034)			
S05_05	S032502	0.997 (0.089)	0.549 (0.057)	0.172 (0.024)		
S05_06	S032679	0.812 (0.052)	1.429 (0.070)			
S05_07	S032184	0.361 (0.078)	1.376 (0.236)	0.180 (0.056)		
S05_08	S032394	0.981 (0.106)	0.598 (0.071)	0.277 (0.027)		
S05_09	S032151	1.106 (0.101)	0.648 (0.051)	0.179 (0.022)		
S05_10A	S032651A	1.206 (0.053)	0.353 (0.025)			
S05_10B	S032651B	1.031 (0.057)	1.148 (0.046)			
S05_11A	S032665A	0.947 (0.046)	0.505 (0.032)			
S05_11B	S032665B	1.076 (0.056)	0.985 (0.039)			
S05_11C	S032665C	0.990 (0.054)	0.919 (0.040)			
S06_01	S042073	0.764 (0.091)	-0.715 (0.206)	0.507 (0.052)		
S06_02	S042017	1.073 (0.132)	1.130 (0.061)	0.216 (0.019)		
S06_03	S042007	1.349 (0.125)	0.786 (0.043)	0.201 (0.018)		
S06_04	S042024	1.286 (0.185)	1.310 (0.065)	0.273 (0.017)		

TIMSS 2015 Eighth Grade Science Item Parameters from Concurrent Calibration (Continued)

Item		Slope (a$_j$)	Location (b$_j$)	Guessing (c$_j$)	Step 1 (d$_{j1}$)	Step 2 (d$_{j2}$)
S06_05	S042095	1.036 (0.075)	-0.282 (0.071)	0.199 (0.032)		
S06_06	S042022	0.918 (0.044)	0.493 (0.033)			
S06_07	S042063	1.016 (0.093)	-1.154 (0.139)	0.401 (0.052)		
S06_08	S042197	1.098 (0.113)	0.791 (0.055)	0.219 (0.021)		
S06_09	S042297	0.548 (0.021)	1.167 (0.044)		-0.959 (0.073)	0.959 (0.087)
S06_10	S042305	0.556 (0.029)	1.190 (0.051)		0.320 (0.053)	-0.320 (0.078)
S06_11	S042112	0.450 (0.057)	-0.012 (0.213)	0.185 (0.056)		
S06_12Z	S042173Z	0.447 (0.019)	-0.667 (0.046)		1.354 (0.084)	-1.354 (0.062)
S06_13	S042407	0.528 (0.034)	0.769 (0.062)			
S06_14	S042278	0.804 (0.043)	0.758 (0.042)			
S06_15	S042274	1.450 (0.183)	1.269 (0.053)	0.222 (0.014)		
S06_17	S042317	0.617 (0.021)	-0.097 (0.027)		-0.471 (0.059)	0.471 (0.056)
S07_01	S032465	0.840 (0.083)	0.153 (0.095)	0.270 (0.035)		
S07_02	S032315	0.862 (0.087)	0.590 (0.071)	0.196 (0.027)		
S07_03	S032306	0.527 (0.017)	0.466 (0.030)		-1.229 (0.076)	1.229 (0.080)
S07_04	S032640	0.590 (0.033)	-0.215 (0.046)			
S07_05	S032579	1.254 (0.188)	1.278 (0.067)	0.305 (0.018)		
S07_06	S032570	0.971 (0.046)	0.501 (0.031)			
S07_07	S032024	1.074 (0.157)	1.265 (0.073)	0.252 (0.020)		
S07_08	S032272	1.142 (0.068)	1.369 (0.052)			
S07_09	S032141	2.043 (0.198)	1.005 (0.032)	0.189 (0.013)		
S07_10	S032060	1.168 (0.051)	-0.434 (0.030)			
S07_11	S032463	1.383 (0.109)	0.255 (0.048)	0.238 (0.023)		
S07_12Z	S032650Z	0.757 (0.030)	0.087 (0.024)		0.164 (0.044)	-0.164 (0.043)
S07_13	S032514	0.605 (0.089)	0.856 (0.121)	0.223 (0.038)		

Items Common in 2011 and 2015:

Item		Slope (a$_j$)	Location (b$_j$)	Guessing (c$_j$)	Step 1 (d$_{j1}$)	Step 2 (d$_{j2}$)
S01_01	S042258	0.803 (0.069)	0.990 (0.053)	0.175 (0.019)		
S01_02	S042005	0.341 (0.008)	0.469 (0.030)		-2.474 (0.089)	2.474 (0.091)
S01_03	S042016	1.019 (0.087)	1.310 (0.045)	0.137 (0.012)		
S01_04A	S042300A	1.389 (0.041)	0.103 (0.016)			
S01_04B	S042300B	0.589 (0.030)	1.603 (0.071)			
S01_04C	S042300C	1.136 (0.035)	0.182 (0.018)			
S01_05	S042319	1.320 (0.044)	0.815 (0.020)			
S01_06	S042068	1.329 (0.098)	0.973 (0.033)	0.216 (0.012)		
S01_07	S042216	1.140 (0.085)	0.494 (0.049)	0.348 (0.019)		

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TIMSS 2015 Eighth Grade Science Item Parameters from Concurrent Calibration (Continued)

Item		Slope (a_j)	Location (b_j)	Guessing (c_j)	Step 1 (d_{j1})	Step 2 (d_{j2})
S01_08	S042249	0.858 (0.062)	0.620 (0.051)	0.185 (0.020)		
S01_09	S042094	0.836 (0.031)	0.788 (0.029)			
S01_10A	S042293A	0.910 (0.030)	-0.320 (0.024)			
S01_10B	S042293B	0.902 (0.045)	1.796 (0.063)			
S01_11	S042195	0.658 (0.034)	1.761 (0.074)			
S01_12	S042400	1.063 (0.039)	0.991 (0.027)			
S01_14	S042164	1.047 (0.063)	0.548 (0.037)	0.145 (0.016)		
S03_01	S052261	0.981 (0.075)	0.754 (0.046)	0.234 (0.018)		
S03_02Z	S052092Z	0.340 (0.013)	0.577 (0.038)		1.011 (0.058)	-1.011 (0.067)
S03_03A	S052263A	1.386 (0.054)	1.277 (0.028)			
S03_03B	S052263B	1.627 (0.057)	1.018 (0.020)			
S03_04	S052265	0.810 (0.031)	0.905 (0.032)			
S03_05	S052280	0.976 (0.069)	0.453 (0.052)	0.267 (0.021)		
S03_06	S052256	1.150 (0.077)	0.762 (0.035)	0.194 (0.015)		
S03_07Z	S052043Z	0.503 (0.025)	1.201 (0.059)			
S03_08	S052194	1.148 (0.080)	0.774 (0.037)	0.213 (0.015)		
S03_09	S052179	0.904 (0.081)	1.044 (0.050)	0.218 (0.017)		
S03_10	S052233	0.755 (0.035)	1.490 (0.054)			
S03_11	S052159	0.497 (0.068)	0.365 (0.204)	0.385 (0.046)		
S03_12A	S052289A	0.841 (0.052)	-0.911 (0.104)	0.279 (0.040)		
S03_12B	S052289B	0.563 (0.051)	0.736 (0.084)	0.140 (0.028)		
S03_12C	S052289C	0.822 (0.031)	0.746 (0.029)			
S05_01	S042053	1.226 (0.067)	-0.124 (0.046)	0.265 (0.022)		
S05_02	S042408	0.739 (0.028)	0.650 (0.030)			
S05_03	S042015	0.959 (0.078)	0.710 (0.051)	0.279 (0.019)		
S05_04	S042309	0.321 (0.047)	1.084 (0.211)	0.144 (0.048)		
S05_05A	S042049A	0.980 (0.032)	-0.579 (0.026)			
S05_05B	S042049B	1.141 (0.036)	0.280 (0.019)			
S05_06	S042182	0.694 (0.048)	-0.311 (0.100)	0.214 (0.035)		
S05_07	S042402	0.886 (0.035)	1.144 (0.036)			
S05_08A	S042228A	1.449 (0.053)	1.105 (0.024)			
S05_08B	S042228B	1.285 (0.038)	0.033 (0.017)			
S05_08C	S042228C	1.527 (0.047)	0.556 (0.016)			
S05_09	S042126	0.784 (0.075)	0.273 (0.099)	0.415 (0.029)		
S05_10	S042210	1.018 (0.131)	1.504 (0.069)	0.293 (0.014)		
S05_11	S042176	1.038 (0.036)	0.694 (0.023)			

TIMSS 2015 Eighth Grade Science Item Parameters from Concurrent Calibration (Continued)

Item		Slope (a_j)	Location (b_j)	Guessing (c_j)	Step 1 (d_{j1})	Step 2 (d_{j2})
S05_12	S042211	0.878 (0.030)	0.163 (0.023)			
S05_13	S042135	0.795 (0.028)	-0.167 (0.026)			
S05_14	S042257	0.674 (0.089)	1.163 (0.086)	0.312 (0.025)		
S06_01	S052003	1.062 (0.083)	0.230 (0.065)	0.431 (0.022)		
S06_02	S052071	1.326 (0.075)	0.510 (0.030)	0.182 (0.014)		
S06_03	S052246	0.921 (0.077)	0.898 (0.049)	0.232 (0.018)		
S06_04	S052276	0.687 (0.052)	0.094 (0.089)	0.221 (0.031)		
S06_05A	S052303A	0.609 (0.051)	-0.008 (0.120)	0.247 (0.037)		
S06_05B	S052303B	0.738 (0.028)	0.541 (0.028)			
S06_06	S052125	0.898 (0.118)	1.099 (0.074)	0.456 (0.019)		
S06_07	S052145	1.274 (0.039)	0.426 (0.017)			
S06_08	S052049	0.701 (0.022)	0.808 (0.023)		0.455 (0.029)	-0.455 (0.039)
S06_09	S052063	0.673 (0.057)	0.627 (0.073)	0.189 (0.026)		
S06_10	S052192	1.403 (0.061)	0.247 (0.024)	0.092 (0.012)		
S06_11	S052232	0.460 (0.074)	1.557 (0.125)	0.198 (0.034)		
S06_12	S052141	1.221 (0.043)	0.892 (0.023)			
S06_13	S052096	0.901 (0.061)	0.070 (0.067)	0.281 (0.026)		
S06_14	S052116	0.836 (0.022)	0.218 (0.016)		0.129 (0.028)	-0.129 (0.028)
S06_15	S052110	0.906 (0.036)	1.073 (0.033)			
S07_01	S042042	0.761 (0.062)	-0.227 (0.114)	0.389 (0.035)		
S07_02	S042030	0.843 (0.034)	1.147 (0.037)			
S07_03	S042003	0.690 (0.075)	0.978 (0.075)	0.261 (0.025)		
S07_04	S042110	0.573 (0.041)	-0.592 (0.137)	0.181 (0.044)		
S07_05A	S042222A	1.001 (0.040)	1.233 (0.035)			
S07_05B	S042222B	0.990 (0.035)	0.859 (0.026)			
S07_05C	S042222C	0.853 (0.059)	0.100 (0.071)	0.270 (0.026)		
S07_06	S042065	0.838 (0.062)	-0.556 (0.113)	0.411 (0.036)		
S07_07	S042280	1.289 (0.065)	0.251 (0.032)	0.162 (0.016)		
S07_08	S042088	0.653 (0.025)	0.060 (0.029)			
S07_09	S042218	1.474 (0.088)	0.531 (0.030)	0.243 (0.014)		
S07_10	S042104	0.918 (0.035)	1.040 (0.032)			
S07_11	S042064	0.859 (0.032)	0.770 (0.028)			
S07_12	S042273	1.213 (0.037)	0.288 (0.018)			
S07_13	S042301	0.839 (0.028)	0.053 (0.024)			
S07_14	S042312	0.405 (0.049)	-0.200 (0.282)	0.263 (0.063)		
S07_15	S042217	1.711 (0.111)	0.734 (0.027)	0.257 (0.012)		

TIMSS 2015 Eighth Grade Science Item Parameters from Concurrent Calibration (Continued)

Item		Slope (a_j)	Location (b_j)	Guessing (c_j)	Step 1 (d_{j1})	Step 2 (d_{j2})
S07_16	S042406	1.105 (0.037)	0.680 (0.021)			
S09_01	S052076	0.883 (0.066)	0.497 (0.057)	0.247 (0.022)		
S09_02	S052272	1.115 (0.034)	-0.028 (0.019)			
S09_03A	S052085A	1.009 (0.041)	1.277 (0.036)			
S09_03B	S052085B	1.072 (0.033)	0.052 (0.019)			
S09_04	S052094	0.612 (0.027)	1.047 (0.045)			
S09_05	S052248	1.010 (0.143)	1.487 (0.073)	0.356 (0.015)		
S09_06	S052146	0.993 (0.032)	0.389 (0.021)			
S09_07	S052282	0.828 (0.064)	0.772 (0.051)	0.177 (0.019)		
S09_08	S052299	1.174 (0.075)	0.330 (0.044)	0.287 (0.019)		
S09_09	S052144	1.294 (0.093)	0.742 (0.036)	0.278 (0.015)		
S09_10	S052214	0.995 (0.032)	0.326 (0.021)			
S09_12	S052101	0.590 (0.026)	0.779 (0.039)			
S09_13	S052113	1.713 (0.106)	0.535 (0.028)	0.294 (0.013)		
S09_14	S052107	0.985 (0.089)	1.255 (0.047)	0.173 (0.014)		
S11_01A	S052090A	0.418 (0.054)	-0.163 (0.299)	0.325 (0.063)		
S11_01B	S052090B	0.608 (0.032)	1.805 (0.079)			
S11_02	S052262	0.821 (0.072)	0.790 (0.059)	0.249 (0.021)		
S11_03	S052267	1.003 (0.074)	0.762 (0.043)	0.216 (0.017)		
S11_04	S052273	0.584 (0.019)	0.874 (0.027)		0.201 (0.036)	-0.201 (0.046)
S11_05Z	S052015Z	0.883 (0.029)	-0.119 (0.023)			
S11_06	S052051	1.053 (0.035)	0.683 (0.022)			
S11_07	S052026	0.581 (0.063)	0.348 (0.139)	0.331 (0.038)		
S11_08	S052130	1.005 (0.092)	1.165 (0.046)	0.219 (0.015)		
S11_09	S052028	0.896 (0.074)	0.595 (0.061)	0.304 (0.022)		
S11_10	S052189	1.085 (0.035)	0.424 (0.020)			
S11_11	S052217	0.737 (0.079)	1.015 (0.070)	0.273 (0.023)		
S11_12	S052038	1.002 (0.094)	1.024 (0.050)	0.292 (0.017)		
S11_13	S052099	0.860 (0.031)	0.762 (0.027)			
S11_14	S052118	0.870 (0.036)	1.241 (0.039)			
S13_01	S052006	0.649 (0.019)	-0.067 (0.021)		0.587 (0.036)	-0.587 (0.033)
S13_02	S052069	1.181 (0.099)	0.809 (0.044)	0.342 (0.016)		
S13_03	S052012	0.966 (0.060)	0.421 (0.045)	0.185 (0.019)		
S13_04	S052021	0.892 (0.031)	0.636 (0.025)			
S13_05Z	S052095Z	0.537 (0.022)	-0.220 (0.036)			

TIMSS 2015 Eighth Grade Science Item Parameters from Concurrent Calibration (Continued)

Item		Slope (a_j)	Location (b_j)	Guessing (c_j)	Step 1 (d_{j1})	Step 2 (d_{j2})
S13_06	S052134	2.039 (0.227)	1.399 (0.036)	0.304 (0.009)		
S13_07	S052054	0.764 (0.026)	-0.391 (0.028)			
S13_08	S052150	0.829 (0.084)	1.211 (0.057)	0.213 (0.018)		
S13_09A	S052243A	0.624 (0.025)	0.388 (0.031)			
S13_09B	S052243B	0.778 (0.028)	0.406 (0.026)			
S13_09C	S052243C	0.705 (0.072)	1.070 (0.066)	0.203 (0.022)		
S13_10	S052206	1.133 (0.071)	0.510 (0.038)	0.211 (0.017)		
S13_11A	S052112A	0.809 (0.067)	0.354 (0.077)	0.321 (0.026)		
S13_11B	S052112B	1.045 (0.037)	0.836 (0.025)			
S13_12	S052294	1.105 (0.057)	-0.039 (0.044)	0.185 (0.020)		
Items Introduced in 2015:						
S02_01	S062189	0.433 (0.022)	0.066 (0.038)		0.305 (0.071)	-0.305 (0.069)
S02_02	S062094	0.984 (0.087)	0.439 (0.064)	0.181 (0.028)		
S02_03	S062118	0.866 (0.040)	0.044 (0.032)			
S02_04A	S062103A	1.165 (0.114)	0.621 (0.058)	0.271 (0.024)		
S02_04B	S062103B	0.715 (0.032)	1.057 (0.035)		0.176 (0.043)	-0.176 (0.059)
S02_05	S062010	0.524 (0.034)	0.795 (0.061)			
S02_06	S062253	0.862 (0.082)	0.859 (0.058)	0.094 (0.022)		
S02_07	S062051	0.886 (0.045)	0.844 (0.039)			
S02_08	S062044	1.070 (0.123)	1.338 (0.059)	0.119 (0.016)		
S02_09	S062046	0.855 (0.040)	0.176 (0.032)			
S02_10	S062149	0.426 (0.031)	0.865 (0.076)			
S02_11	S062268	1.024 (0.088)	-0.280 (0.097)	0.296 (0.041)		
S02_12	S062170	0.723 (0.098)	0.280 (0.155)	0.358 (0.047)		
S02_13	S062234	0.791 (0.032)	0.637 (0.027)		0.649 (0.037)	-0.649 (0.047)
S02_14	S062271	0.773 (0.117)	0.991 (0.099)	0.290 (0.033)		
S04_01	S062099	0.827 (0.073)	0.268 (0.079)	0.137 (0.033)		
S04_02	S062095	0.459 (0.022)	0.693 (0.041)		-0.087 (0.065)	0.087 (0.076)
S04_03	S062106	0.651 (0.051)	-1.064 (0.161)	0.000 (0.066)		
S04_04	S062064	0.899 (0.041)	-0.375 (0.035)			
S04_05	S062132	0.918 (0.096)	0.360 (0.088)	0.282 (0.034)		
S04_06	S062163	1.161 (0.066)	1.337 (0.047)			
S04_07	S062153	1.203 (0.142)	0.947 (0.058)	0.298 (0.021)		
S04_08	S062018	0.533 (0.023)	1.452 (0.056)		-0.647 (0.069)	0.647 (0.092)
S04_09	S062143	0.845 (0.057)	1.710 (0.083)			

TIMSS 2015 Eighth Grade Science Item Parameters from Concurrent Calibration (Continued)

Item		Slope (a$_j$)	Location (b$_j$)	Guessing (c$_j$)	Step 1 (d$_{j1}$)	Step 2 (d$_{j2}$)
S04_10	S062276	0.693 (0.040)	0.919 (0.052)			
S04_11	S062050	0.979 (0.050)	0.944 (0.039)			
S04_12	S062205	1.070 (0.098)	0.771 (0.050)	0.150 (0.021)		
S04_13	S062190	0.869 (0.072)	0.074 (0.081)	0.144 (0.035)		
S04_14A	S062024A	0.575 (0.099)	0.937 (0.148)	0.237 (0.047)		
S04_14B	S062024B	0.782 (0.050)	1.500 (0.073)			
S08_01	S062055	0.995 (0.118)	0.140 (0.114)	0.463 (0.036)		
S08_02	S062007	1.183 (0.098)	0.464 (0.051)	0.192 (0.023)		
S08_03	S062275	0.916 (0.046)	0.703 (0.035)			
S08_04	S062225	1.201 (0.173)	1.307 (0.065)	0.259 (0.019)		
S08_05	S062111	0.541 (0.024)	0.536 (0.033)		0.013 (0.056)	-0.013 (0.063)
S08_06A	S062116A	1.156 (0.052)	0.580 (0.027)			
S08_06B	S062116B	1.332 (0.064)	0.931 (0.030)			
S08_06C	S062116C	0.910 (0.054)	1.334 (0.056)			
S08_07	S062262	0.900 (0.129)	1.070 (0.079)	0.286 (0.027)		
S08_08	S062035	1.016 (0.116)	0.996 (0.059)	0.198 (0.022)		
S08_09	S062144	0.677 (0.066)	-0.421 (0.161)	0.161 (0.060)		
S08_10	S062162	0.784 (0.042)	0.792 (0.042)			
S08_11	S062233	0.958 (0.126)	0.783 (0.083)	0.349 (0.029)		
S08_13	S062171	0.399 (0.084)	0.558 (0.346)	0.153 (0.092)		
S10_01	S062090	0.988 (0.100)	0.120 (0.095)	0.335 (0.036)		
S10_02	S062274	0.599 (0.024)	0.818 (0.036)		1.097 (0.047)	-1.097 (0.066)
S10_03	S062284	0.399 (0.081)	0.390 (0.372)	0.162 (0.096)		
S10_04A	S062098A	0.616 (0.024)	0.399 (0.028)		-0.070 (0.052)	0.070 (0.055)
S10_04B	S062098B	0.745 (0.033)	1.278 (0.040)		-0.137 (0.047)	0.137 (0.066)
S10_05	S062032	1.779 (0.280)	1.448 (0.057)	0.296 (0.014)		
S10_06	S062043	0.913 (0.047)	0.902 (0.040)			
S10_07	S062158	0.781 (0.117)	0.819 (0.110)	0.349 (0.035)		
S10_08	S062159	0.977 (0.086)	0.336 (0.069)	0.197 (0.029)		
S10_09	S062005	1.309 (0.058)	0.638 (0.026)			
S10_10	S062075	1.073 (0.130)	0.780 (0.071)	0.343 (0.025)		
S10_11	S062004	1.836 (0.150)	0.825 (0.031)	0.171 (0.014)		
S10_12	S062175	0.781 (0.041)	0.641 (0.039)			
S10_13A	S062173A	0.716 (0.037)	0.313 (0.038)			
S10_13B	S062173B	0.881 (0.153)	1.622 (0.104)	0.202 (0.021)		

TIMSS 2015 Eighth Grade Science Item Parameters from Concurrent Calibration (Continued)

Item		Slope (a_j)	Location (b_j)	Guessing (c_j)	Step 1 (d_{j1})	Step 2 (d_{j2})
S12_01	S062279	1.215 (0.091)	0.238 (0.052)	0.187 (0.024)		
S12_02	S062112	0.554 (0.032)	0.069 (0.047)			
S12_03	S062119	1.214 (0.097)	0.221 (0.057)	0.232 (0.026)		
S12_04	S062093	0.641 (0.027)	0.097 (0.028)		0.289 (0.050)	-0.289 (0.048)
S12_05	S062089	1.301 (0.120)	0.958 (0.042)	0.153 (0.016)		
S12_06	S062006	1.016 (0.046)	0.402 (0.029)			
S12_07	S062067	0.829 (0.040)	0.400 (0.034)			
S12_08	S062247	1.082 (0.159)	1.321 (0.071)	0.264 (0.020)		
S12_09	S062177	0.823 (0.111)	1.065 (0.079)	0.223 (0.027)		
S12_10	S062186	1.592 (0.184)	1.133 (0.044)	0.256 (0.015)		
S12_11A	S062211A	0.780 (0.039)	0.401 (0.036)			
S12_11B	S062211B	0.843 (0.068)	2.084 (0.119)			
S12_13	S062033	1.143 (0.053)	0.673 (0.029)			
S12_14	S062037	0.891 (0.113)	0.698 (0.088)	0.326 (0.030)		
S12_15	S062242	0.755 (0.038)	-1.198 (0.061)			
S14_01A	S062091A	1.052 (0.097)	-0.523 (0.118)	0.384 (0.047)		
S14_01B	S062091B	0.570 (0.043)	-1.056 (0.096)	0.250 (0.000)		
S14_02	S062100	0.884 (0.042)	0.337 (0.032)			
S14_03	S062097	0.912 (0.080)	0.363 (0.069)	0.151 (0.030)		
S14_04	S062101	0.664 (0.028)	0.196 (0.027)		0.297 (0.047)	-0.297 (0.048)
S14_06	S062128	0.890 (0.041)	-0.002 (0.032)			
S14_07	S062047	0.488 (0.033)	0.716 (0.063)			
S14_08	S062042	0.718 (0.039)	0.667 (0.043)			
S14_09	S062250	0.552 (0.037)	1.133 (0.073)			
S14_10	S062246	0.940 (0.139)	1.185 (0.077)	0.279 (0.024)		
S14_11	S062056	1.093 (0.049)	0.459 (0.028)			
S14_12	S062235	0.751 (0.089)	0.707 (0.091)	0.186 (0.034)		
S14_13	S062180	1.272 (0.108)	0.386 (0.053)	0.243 (0.025)		
S14_14	S062022	0.596 (0.035)	0.627 (0.050)			
S14_15	S062243	0.625 (0.022)	0.030 (0.027)		-0.322 (0.056)	0.322 (0.054)