Appendix 13B: TIMSS 2015 Fourth Grade Science Item Parameters from Concurrent Calibration

TIMSS 2015 Fourth 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	S031356	1.128 (0.101)	-0.924 (0.117)	0.485 (0.039)		
S01_02	S031291	1.368 (0.090)	-0.780 (0.064)	0.260 (0.031)		
S01_03	S031230	0.770 (0.060)	-1.374 (0.155)	0.231 (0.053)		
S01_04	S031325	0.620 (0.034)	0.440 (0.041)			
S01_05	S031068	1.163 (0.108)	0.589 (0.051)	0.276 (0.022)		
S01_06	S031418	0.807 (0.072)	0.551 (0.062)	0.152 (0.024)		
S01_07Z	S031197Z	0.441 (0.016)	-0.873 (0.046)		-0.548 (0.083)	0.548 (0.067)
S01_08	S031371	0.790 (0.079)	0.588 (0.070)	0.193 (0.027)		
S01_09	S031376	1.197 (0.121)	0.917 (0.047)	0.220 (0.018)		
S01_10	S031044	0.635 (0.033)	-0.023 (0.038)			
S01_11Z	S031390Z	0.760 (0.030)	0.195 (0.022)		0.399 (0.038)	-0.399 (0.038)
S02_01	S051057	0.692 (0.034)	-0.092 (0.036)			
S02_02	S051032	0.962 (0.081)	0.400 (0.057)	0.199 (0.024)		
S02_03Z	S051049Z	0.328 (0.027)	0.599 (0.080)			
S02_04	S051033	0.791 (0.111)	0.941 (0.085)	0.304 (0.028)		
S02_05	S051173	0.914 (0.050)	1.120 (0.047)			
S02_06	S051086	0.757 (0.063)	-0.757 (0.128)	0.248 (0.044)		
S02_07	S051179	0.883 (0.063)	-0.815 (0.098)	0.209 (0.038)		
S02_08	S051074	0.452 (0.033)	1.252 (0.091)			
S02_09	S051119	0.634 (0.038)	1.039 (0.059)			
S02_10	S051071	0.890 (0.086)	0.644 (0.060)	0.196 (0.024)		
S02_11	S051100	1.353 (0.128)	1.040 (0.041)	0.148 (0.014)		
S02_12	S051156	1.420 (0.169)	1.275 (0.052)	0.185 (0.013)		
S03_01	S041117	0.558 (0.051)	-2.428 (0.318)	0.282 (0.092)		
S03_02	S041120	1.784 (0.276)	1.166 (0.054)	0.436 (0.014)		
S03_03	S041003	0.603 (0.032)	0.010 (0.040)			
S03_04	S041224	0.869 (0.033)	0.433 (0.021)		0.380 (0.032)	-0.380 (0.037)
S03_05	S041163	0.566 (0.140)	1.784 (0.196)	0.278 (0.033)		
S03_06	S041039	0.788 (0.037)	-0.032 (0.032)			
S03_07	S041014	1.739 (0.239)	1.317 (0.052)	0.250 (0.013)		
S03_08	S041181	0.601 (0.031)	-0.533 (0.048)			
S03_09	S041174	0.821 (0.040)	0.455 (0.032)			
S03_10	S041049	1.041 (0.089)	0.461 (0.054)	0.212 (0.024)		

TIMSS 2015 Fourth 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_11	S041208	0.259 (0.074)	1.138 (0.521)	0.277 (0.086)		
S03_12	S041060	1.008 (0.056)	1.138 (0.046)			
S03_13A	S041201A	1.181 (0.050)	0.200 (0.023)			
S03_13B	S041201B	1.187 (0.054)	0.444 (0.024)			
S05_01	S031340	0.810 (0.086)	0.692 (0.070)	0.213 (0.026)		
S05_02	S031236	0.743 (0.061)	-0.584 (0.117)	0.222 (0.040)		
S05_03Z	S031391Z	0.557 (0.024)	0.287 (0.028)		0.141 (0.050)	-0.141 (0.052)
S05_04	S031361	0.790 (0.088)	0.441 (0.090)	0.301 (0.031)		
S05_05	S031001	1.113 (0.071)	-0.775 (0.071)	0.192 (0.031)		
S05_07	S031410	0.473 (0.070)	-0.047 (0.248)	0.305 (0.058)		
S05_08	S031421	0.513 (0.029)	-0.622 (0.058)			
S05_09	S031298	1.262 (0.207)	1.468 (0.081)	0.266 (0.016)		
S05_10	S031076	0.700 (0.037)	0.520 (0.038)			
S05_11	S031275	0.899 (0.152)	1.484 (0.100)	0.242 (0.021)		
S06_01	S041311	0.594 (0.052)	-2.574 (0.314)	0.298 (0.095)		
S06_02	S041178	1.170 (0.143)	0.830 (0.060)	0.380 (0.021)		
S06_03	S041182	0.692 (0.035)	0.285 (0.035)			
S06_04	S041180	1.452 (0.098)	0.180 (0.039)	0.220 (0.021)		
S06_05	S041187	1.189 (0.229)	1.698 (0.117)	0.224 (0.015)		
S06_06A	S041013A	0.586 (0.036)	0.890 (0.056)			
S06_06B	S041013B	0.577 (0.040)	1.431 (0.086)			
S06_07	S041067	0.929 (0.040)	-0.326 (0.032)			
S06_08	S041305	1.276 (0.121)	0.743 (0.045)	0.261 (0.019)		
S06_09	S041048	0.901 (0.041)	0.259 (0.028)			
S06_10	S041110	0.698 (0.034)	-0.249 (0.038)			
S06_11	S041069	1.152 (0.111)	0.431 (0.060)	0.350 (0.024)		
S06_12	S041100	1.314 (0.098)	0.495 (0.038)	0.185 (0.019)		
S06_13	S041092	0.843 (0.082)	0.232 (0.085)	0.288 (0.031)		
S07_01	S031254	0.644 (0.113)	0.930 (0.128)	0.381 (0.035)		
S07_02	S031266	1.210 (0.079)	0.158 (0.042)	0.158 (0.020)		
S07_03	S031233	0.644 (0.032)	-0.446 (0.044)			
S07_04	S031204	0.652 (0.035)	0.495 (0.040)			
S07_05	S031273	1.451 (0.108)	0.284 (0.041)	0.261 (0.021)		
S07_06	S031299	0.563 (0.033)	0.502 (0.046)			
S07_07	S031281	0.965 (0.069)	-0.982 (0.100)	0.238 (0.039)		

TIMSS 2015 Fourth 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_08	S031077	0.710 (0.072)	-0.375 (0.143)	0.332 (0.043)		
S07_09	S031311	1.200 (0.093)	0.085 (0.057)	0.290 (0.026)		
S07_10Z	S031088Z	0.583 (0.017)	0.136 (0.034)		1.498 (0.052)	-1.498 (0.053)
S07_11	S031389	1.229 (0.131)	0.943 (0.048)	0.240 (0.018)		
Items Common in 2011 and 2015:						
S01_01	S041010	1.003 (0.052)	-0.763 (0.066)	0.253 (0.028)		
S01_02	S041034	0.631 (0.048)	-0.167 (0.108)	0.259 (0.034)		
S01_03	S041017	0.978 (0.085)	1.031 (0.045)	0.256 (0.016)		
S01_04	S041124	1.128 (0.087)	0.882 (0.038)	0.276 (0.015)		
S01_05	S041186	0.643 (0.028)	1.086 (0.042)			
S01_06	S041037	0.568 (0.015)	-0.101 (0.020)		-0.104 (0.038)	0.104 (0.035)
S01_07	S041119	1.115 (0.077)	0.112 (0.058)	0.438 (0.021)		
S01_08	S041105	0.957 (0.047)	-0.105 (0.045)	0.157 (0.020)		
S01_10Z	S041149Z	0.632 (0.015)	0.969 (0.021)		-1.015 (0.043)	1.015 (0.049)
S01_11	S041032	0.886 (0.029)	-1.284 (0.040)			
S01_12	S041068	0.768 (0.027)	0.283 (0.023)			
S01_13	S041303	0.708 (0.066)	0.777 (0.069)	0.258 (0.024)		
S03_01	S051041	0.987 (0.084)	0.726 (0.051)	0.359 (0.018)		
S03_02	S051037	0.804 (0.027)	0.073 (0.022)			
S03_03	S051008	0.917 (0.035)	1.120 (0.032)			
S03_04	S051004	1.422 (0.068)	-0.031 (0.033)	0.254 (0.018)		
S03_05Z	S051026Z	0.538 (0.024)	0.810 (0.040)			
S03_06	S051130	0.580 (0.028)	1.384 (0.058)			
S03_07	S051114	1.283 (0.082)	0.640 (0.032)	0.262 (0.015)		
S03_08Z	S051121Z	0.398 (0.020)	0.191 (0.041)			
S03_09	S051147	0.821 (0.031)	0.972 (0.031)			
S03_10	S051105	1.025 (0.063)	-0.076 (0.059)	0.341 (0.023)		
S03_11	S051110	0.936 (0.053)	0.082 (0.049)	0.207 (0.021)		
S03_12	S051111	1.198 (0.083)	0.382 (0.046)	0.386 (0.018)		
S05_01	S041009	0.842 (0.049)	-0.764 (0.086)	0.283 (0.031)		
S05_02	S041223	1.101 (0.071)	0.385 (0.042)	0.301 (0.018)		
S05_03	S041026	0.532 (0.042)	0.337 (0.085)	0.126 (0.027)		
S05_04	S041177	0.370 (0.015)	1.186 (0.046)		0.325 (0.049)	-0.325 (0.066)
S05_05	S041183	0.660 (0.015)	0.236 (0.020)		1.114 (0.031)	-1.114 (0.033)
S05_06	S041008	1.172 (0.078)	0.706 (0.034)	0.239 (0.014)		

TIMSS 2015 Fourth 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_08	S041195	0.675 (0.032)	1.460 (0.056)			
S05_09A	S041134A	0.868 (0.033)	0.967 (0.030)			
S05_09B	S041134B	0.802 (0.027)	0.137 (0.022)			
S05_09C	S041134C	0.797 (0.055)	0.509 (0.051)	0.193 (0.020)		
S05_10	S041191	0.946 (0.088)	0.924 (0.051)	0.322 (0.017)		
S05_11	S041107	0.394 (0.010)	-0.849 (0.034)		-0.940 (0.066)	0.940 (0.056)
S05_12	S041113	0.837 (0.029)	0.414 (0.022)			
S06_01	S051185	1.092 (0.057)	0.362 (0.033)	0.165 (0.015)		
S06_02	S051048	0.653 (0.018)	0.110 (0.017)		0.168 (0.032)	-0.168 (0.031)
S06_03	S051164	0.912 (0.042)	1.585 (0.052)			
S06_04	S051186	0.622 (0.022)	-0.939 (0.041)			
S06_05	S051137	0.720 (0.040)	-0.930 (0.095)	0.165 (0.034)		
S06_06	S051007	0.894 (0.028)	-0.048 (0.021)			
S06_07	S051087	1.091 (0.056)	-0.420 (0.054)	0.278 (0.023)		
S06_08Z	S051188Z	0.602 (0.023)	0.277 (0.028)			
S06_10	S051201	0.715 (0.026)	0.419 (0.025)			
S06_11	S051102	0.923 (0.057)	0.175 (0.052)	0.249 (0.021)		
S06_12	S051095	0.585 (0.022)	-0.364 (0.033)			
S07_01	S041027	0.727 (0.025)	-1.765 (0.055)			
S07_02	S041043	0.626 (0.022)	-0.557 (0.034)			
S07_03	S041050	0.457 (0.049)	0.614 (0.127)	0.180 (0.037)		
S07_04	S041070	0.930 (0.059)	0.452 (0.045)	0.215 (0.019)		
S07_05	S041006	0.463 (0.016)	0.646 (0.027)		0.302 (0.040)	-0.302 (0.047)
S07_06	S041052	1.036 (0.064)	-0.225 (0.065)	0.381 (0.025)		
S07_07	S041301	0.657 (0.027)	0.915 (0.036)			
S07_09	S041033	0.884 (0.034)	1.049 (0.031)			
S07_11	S041077	0.749 (0.027)	0.348 (0.024)			
S07_12	S041209	0.707 (0.057)	0.763 (0.057)	0.172 (0.021)		
S07_13	S041081	0.535 (0.014)	0.514 (0.020)		-0.408 (0.040)	0.408 (0.043)
S07_14	S041102	0.982 (0.055)	-0.120 (0.054)	0.244 (0.023)		
S09_01	S051044	0.524 (0.022)	0.178 (0.032)			
S09_03	S051003	0.765 (0.041)	-0.024 (0.051)	0.112 (0.020)		
S09_04	S051168	0.778 (0.026)	-0.076 (0.023)			
S09_05	S051010	0.830 (0.027)	0.093 (0.021)			
S09_06	S051035	1.462 (0.137)	1.283 (0.039)	0.250 (0.010)		

TIMSS 2015 Fourth 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})
S09_07	S051059	0.632 (0.024)	0.193 (0.027)			
S09_08	S051142	0.954 (0.063)	0.613 (0.040)	0.197 (0.017)		
S09_09A	S051131A	1.099 (0.055)	-0.002 (0.040)	0.205 (0.019)		
S09_09B	S051131B	1.154 (0.072)	0.632 (0.033)	0.210 (0.015)		
S09_10	S051151	0.998 (0.031)	-0.976 (0.031)			
S09_11	S051157	0.839 (0.070)	0.956 (0.048)	0.200 (0.017)		
S11_01	S051161	0.495 (0.054)	0.683 (0.114)	0.207 (0.034)		
S11_02	S051051	1.821 (0.191)	1.349 (0.037)	0.311 (0.009)		
S11_03Z	S051138Z	0.592 (0.023)	0.378 (0.029)			
S11_04	S051194	1.004 (0.036)	1.014 (0.027)			
S11_05	S051029	0.527 (0.070)	1.330 (0.095)	0.216 (0.028)		
S11_06	S051077	0.842 (0.027)	-0.154 (0.023)			
S11_07	S051200	0.737 (0.031)	1.156 (0.040)			
S11_08	S051075	0.749 (0.025)	-0.471 (0.029)			
S11_09	S051065	1.026 (0.065)	-0.015 (0.059)	0.352 (0.023)		
S11_10	S051191	1.348 (0.075)	0.552 (0.028)	0.204 (0.014)		
S11_11	S051099	0.927 (0.057)	0.298 (0.049)	0.222 (0.020)		
S11_12	S051175	0.912 (0.034)	0.946 (0.028)			
S13_01	S051054	1.026 (0.051)	-0.387 (0.052)	0.223 (0.023)		
S13_02	S051024	0.689 (0.026)	0.646 (0.028)			
S13_03A	S051132A	0.975 (0.037)	1.163 (0.032)			
S13_03B	S051132B	0.864 (0.033)	0.977 (0.030)			
S13_04	S051040	0.430 (0.021)	0.553 (0.042)			
S13_05	S051193	1.043 (0.062)	0.035 (0.051)	0.307 (0.021)		
S13_06	S051063	1.263 (0.083)	0.810 (0.030)	0.220 (0.013)		
S13_07	S051012	1.149 (0.068)	0.323 (0.039)	0.272 (0.018)		
S13_08	S051115	1.216 (0.036)	0.142 (0.016)			
S13_09	S051180	1.014 (0.073)	0.228 (0.059)	0.395 (0.021)		
S13_10	S051106	1.150 (0.080)	0.785 (0.035)	0.240 (0.015)		
S13_11	S051148	1.145 (0.068)	0.277 (0.041)	0.276 (0.018)		
Items Introduced in 2015:						
S02_01	S061105	0.685 (0.094)	0.184 (0.166)	0.416 (0.045)		
S02_02	S061010	0.431 (0.028)	0.023 (0.053)			
S02_03	S061028	0.931 (0.141)	1.183 (0.079)	0.326 (0.024)		
S02_04	S061065	1.076 (0.076)	-0.144 (0.065)	0.214 (0.031)		

TIMSS 2015 Fourth 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})
S02_05	S061130	0.856 (0.041)	0.433 (0.030)			
S02_06	S061081	0.979 (0.047)	0.762 (0.032)			
S02_07	S061060	0.851 (0.039)	0.024 (0.030)			
S02_08	S061075	0.584 (0.055)	-0.371 (0.154)	0.088 (0.053)		
S02_09	S061031	1.085 (0.051)	0.817 (0.030)			
S02_10A	S061049A	0.682 (0.048)	-0.473 (0.093)	0.017 (0.034)		
S02_10B	S061049B	0.584 (0.064)	0.235 (0.129)	0.130 (0.045)		
S02_11	S061098	0.836 (0.130)	1.257 (0.086)	0.276 (0.026)		
S02_12	S061172	0.628 (0.038)	1.015 (0.056)			
S04_01	S061135	0.734 (0.066)	-0.690 (0.149)	0.246 (0.052)		
S04_02	S061069	0.400 (0.026)	-0.365 (0.064)			
S04_03	S061134	0.634 (0.057)	0.124 (0.096)	0.086 (0.035)		
S04_04	S061140	1.031 (0.103)	0.586 (0.063)	0.296 (0.025)		
S04_05	S061019	0.892 (0.046)	0.934 (0.039)			
S04_06	S061022	0.639 (0.075)	0.301 (0.129)	0.245 (0.042)		
S04_07	S061036	0.997 (0.048)	0.852 (0.033)			
S04_08	S061160	0.748 (0.035)	-0.885 (0.050)			
S04_09	S061159	0.907 (0.040)	-0.715 (0.041)			
S04_10	S061091	0.444 (0.022)	1.207 (0.055)		-0.162 (0.062)	0.162 (0.082)
S04_11	S061118	1.080 (0.101)	0.641 (0.054)	0.245 (0.023)		
S04_12	S061097	0.825 (0.095)	0.584 (0.087)	0.300 (0.032)		
S08_01	S061141	1.416 (0.123)	0.524 (0.045)	0.305 (0.021)		
S08_02	S061023	0.777 (0.037)	0.178 (0.031)			
S08_03	S061054	0.470 (0.016)	0.738 (0.040)		1.567 (0.055)	-1.567 (0.074)
S08_04	S061007	0.680 (0.060)	-0.235 (0.118)	0.130 (0.044)		
S08_05	S061006	0.897 (0.040)	-0.566 (0.038)			
S08_06	S061108	1.090 (0.102)	0.266 (0.071)	0.345 (0.029)		
S08_07	S061109	0.525 (0.080)	0.605 (0.166)	0.210 (0.052)		
S08_08	S061080	0.986 (0.088)	0.258 (0.072)	0.273 (0.030)		
S08_09	S061088	0.756 (0.045)	1.252 (0.059)			
S08_10	S061151	0.987 (0.045)	0.473 (0.027)			
S08_11	S061150	0.711 (0.037)	0.458 (0.036)			
S08_12	S061169	1.133 (0.093)	0.191 (0.062)	0.273 (0.028)		
S10_01	S061071	0.375 (0.035)	-0.951 (0.122)	0.250 (0.000)		
S10_02	S061138	0.689 (0.034)	-0.023 (0.036)			

TIMSS 2015 Fourth 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})
S10_03A	S061016A	0.939 (0.083)	0.397 (0.064)	0.210 (0.028)		
S10_03B	S061016B	1.032 (0.047)	0.570 (0.027)			
S10_04	S061011	0.823 (0.037)	-0.393 (0.036)			
S10_06	S061083	0.723 (0.034)	-0.872 (0.051)			
S10_07	S061034	0.832 (0.047)	1.120 (0.049)			
S10_08	S061044	0.800 (0.040)	0.568 (0.034)			
S10_09A	S061142A	0.678 (0.036)	0.451 (0.037)			
S10_09B	S061142B	0.841 (0.046)	0.992 (0.044)			
S10_10A	S061115A	1.649 (0.128)	0.419 (0.038)	0.282 (0.020)		
S10_10B	S061115B	1.465 (0.141)	0.669 (0.044)	0.325 (0.020)		
S12_01	S061132	0.794 (0.087)	0.654 (0.078)	0.222 (0.030)		
S12_02	S061120	1.033 (0.086)	0.411 (0.057)	0.212 (0.026)		
S12_03	S061025	0.556 (0.030)	-0.445 (0.051)			
S12_04A	S061133A	1.417 (0.110)	0.263 (0.048)	0.303 (0.024)		
S12_04B	S061133B	1.835 (0.131)	0.824 (0.025)	0.120 (0.012)		
S12_05	S061074	0.860 (0.040)	0.227 (0.029)			
S12_06	S061093	0.817 (0.027)	0.009 (0.024)		0.914 (0.040)	-0.914 (0.034)
S12_07	S061161	0.693 (0.038)	0.686 (0.040)			
S12_08A	S061042A	1.493 (0.136)	0.801 (0.038)	0.250 (0.018)		
S12_08B	S061042B	0.812 (0.078)	0.672 (0.064)	0.141 (0.026)		
S12_09A	S061041A	0.903 (0.041)	0.127 (0.028)			
S12_09B	S061041B	0.836 (0.040)	0.236 (0.030)			
S12_10	S061155	0.809 (0.077)	-0.453 (0.138)	0.305 (0.049)		
S14_02	S061014	0.521 (0.022)	-0.646 (0.037)		0.853 (0.066)	-0.853 (0.047)
S14_03	S061056	0.951 (0.041)	-0.682 (0.038)			
S14_04	S061015	0.786 (0.036)	-0.304 (0.036)			
S14_05	S061113	0.829 (0.043)	0.866 (0.039)			
S14_06	S061107	1.017 (0.090)	0.677 (0.051)	0.180 (0.022)		
S14_07	S061046	1.220 (0.118)	0.842 (0.046)	0.233 (0.019)		
S14_08	S061047	0.849 (0.081)	-0.380 (0.126)	0.366 (0.043)		
S14_09	S061048	1.466 (0.120)	0.590 (0.039)	0.252 (0.019)		
S14_10	S061096	1.221 (0.116)	0.730 (0.048)	0.264 (0.021)		
S14_11	S061124	0.628 (0.039)	1.201 (0.065)			
S14_12	S061116	0.707 (0.036)	0.192 (0.034)			