

Appendix 12A: Mathematics Item Parameters from the paperTIMSS 2019 Concurrent Calibration—Grade 4

Item		RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
		2015	2019					
Items Released in 2015:								
M01_01	M041004	0.050	—	0.969 (0.064)	-1.538 (0.116)	0.207 (0.055)		
M01_02	M041023	0.028	—	1.559 (0.091)	-0.857 (0.049)	0.184 (0.029)		
M01_03	M041034	0.024	—	0.928 (0.061)	-0.084 (0.064)	0.159 (0.027)		
M01_04	M041087	0.030	—	0.766 (0.032)	-0.203 (0.033)			
M01_05	M041124	0.027	—	0.938 (0.036)	-0.346 (0.029)			
M01_06A	M041302A	0.026	—	1.038 (0.062)	-0.705 (0.069)	0.161 (0.033)		
M01_06B	M041302B	0.040	—	0.602 (0.028)	-0.419 (0.042)			
M01_06C	M041302C	0.023	—	1.034 (0.039)	-0.415 (0.028)			
M01_07	M041254	0.025	—	0.671 (0.063)	0.211 (0.109)	0.222 (0.036)		
M01_08	M041153	0.020	—	1.020 (0.065)	0.072 (0.051)	0.139 (0.022)		
M01_09	M041132	0.033	—	0.476 (0.056)	0.907 (0.125)	0.131 (0.036)		
M01_10	M041165	0.040	—	0.352 (0.013)	0.396 (0.039)		-0.984 (0.083)	0.984 (0.088)
M01_11	M041174	0.030	—	1.077 (0.042)	-0.785 (0.032)			
M01_12	M041191	0.028	—	0.997 (0.075)	-1.157 (0.122)	0.336 (0.051)		
M02_01	M061272	0.023	—	0.817 (0.034)	0.080 (0.030)			
M02_02	M061243	0.030	—	0.468 (0.014)	-0.315 (0.030)		-0.992 (0.072)	0.992 (0.068)
M02_03	M061029	0.028	—	1.087 (0.064)	-0.367 (0.055)	0.145 (0.026)		
M02_04	M061031	0.028	—	1.411 (0.078)	0.493 (0.027)	0.069 (0.011)		
M02_05	M061050	0.022	—	1.275 (0.089)	0.500 (0.039)	0.181 (0.017)		
M02_06	M061167	0.045	—	0.692 (0.031)	-0.973 (0.048)			
M02_07	M061206	0.022	—	0.712 (0.063)	0.736 (0.067)	0.121 (0.024)		
M02_08A	M061265A	0.026	—	0.953 (0.039)	0.371 (0.028)			
M02_08B	M061265B	0.025	—	0.912 (0.090)	1.082 (0.059)	0.179 (0.018)		
M02_09	M061185	0.031	—	0.963 (0.059)	-0.575 (0.070)	0.145 (0.032)		
M02_10	M061239	0.041	—	1.356 (0.053)	-0.734 (0.027)			
M03_01	M051205	0.037	—	0.709 (0.031)	-0.367 (0.036)			
M03_02	M051039	0.029	—	1.082 (0.041)	-0.204 (0.025)			
M03_03	M051055	0.023	—	1.076 (0.046)	0.853 (0.031)			
M03_04	M051006	0.035	—	0.522 (0.019)	1.049 (0.039)		-0.539 (0.058)	0.539 (0.072)
M03_05	M051070	0.026	—	1.344 (0.108)	0.913 (0.038)	0.178 (0.014)		
M03_06	M051018	0.019	—	0.864 (0.077)	0.530 (0.068)	0.227 (0.025)		
M03_07	M051407	0.024	—	0.852 (0.065)	0.016 (0.076)	0.197 (0.030)		
M03_08	M051410	0.022	—	0.883 (0.069)	0.445 (0.060)	0.166 (0.023)		
M03_09	M051059	0.060	—	0.685 (0.032)	-1.412 (0.060)			
M03_10	M051093	0.021	—	0.768 (0.069)	0.658 (0.069)	0.164 (0.025)		
M03_11	M051134	0.034	—	1.187 (0.046)	0.332 (0.023)			
M03_12	M051077	0.027	—	1.117 (0.064)	0.104 (0.040)	0.085 (0.017)		

Item		RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
		2015	2019					
M05_01	M041291	0.043	—	0.689 (0.031)	-0.796 (0.045)			
M05_02	M041289	0.023	—	1.059 (0.084)	0.160 (0.065)	0.299 (0.026)		
M05_03	M041068	0.031	—	1.105 (0.067)	0.503 (0.036)	0.082 (0.015)		
M05_04A	M041065A	0.024	—	1.435 (0.099)	0.596 (0.034)	0.182 (0.015)		
M05_04B	M041065B	0.024	—	0.929 (0.042)	1.027 (0.039)			
M05_05	M041096	0.024	—	0.989 (0.066)	0.514 (0.044)	0.106 (0.018)		
M05_06	M041125	0.020	—	1.114 (0.089)	0.765 (0.045)	0.186 (0.017)		
M05_07	M041135	0.032	—	0.731 (0.066)	-0.732 (0.166)	0.358 (0.053)		
M05_08	M041257	0.027	—	0.728 (0.032)	0.246 (0.034)			
M05_09	M041268	0.024	—	1.731 (0.147)	0.979 (0.034)	0.227 (0.012)		
M05_10	M041151	0.037	—	0.483 (0.047)	-0.528 (0.214)	0.191 (0.060)		
M05_11	M041264	0.027	—	0.508 (0.062)	0.471 (0.164)	0.225 (0.046)		
M05_12	M041182	0.080	—	0.769 (0.037)	-1.784 (0.069)			
M05_13	M041200	0.049	—	0.447 (0.017)	-0.623 (0.039)		-0.221 (0.073)	0.221 (0.062)
M06_01	M051140	0.029	—	0.664 (0.057)	0.143 (0.101)	0.176 (0.035)		
M06_02	M051017	0.018	—	0.924 (0.089)	0.628 (0.069)	0.298 (0.024)		
M06_03	M051111	0.025	—	0.706 (0.034)	0.911 (0.045)			
M06_04	M051089	0.030	—	1.104 (0.045)	0.657 (0.027)			
M06_05	M051094	0.027	—	1.059 (0.078)	0.399 (0.051)	0.201 (0.021)		
M06_06	M051227	0.028	—	1.009 (0.046)	1.115 (0.039)			
M06_07	M051060	0.029	—	0.593 (0.059)	0.535 (0.105)	0.163 (0.034)		
M06_08Z	M051061Z	0.028	—	0.700 (0.033)	0.659 (0.040)			
M06_09	M051129	0.035	—	0.645 (0.055)	-0.311 (0.133)	0.203 (0.045)		
M06_10	M051236	0.040	—	0.846 (0.035)	0.035 (0.030)			
M06_11A	M051125A	0.086	—	0.796 (0.038)	-1.791 (0.067)			
M06_11B	M051125B	0.030	—	0.642 (0.064)	0.001 (0.138)	0.253 (0.043)		
M07_01	M041298	0.043	—	0.930 (0.065)	-0.782 (0.099)	0.253 (0.041)		
M07_02	M041007	0.027	—	0.807 (0.066)	0.321 (0.071)	0.182 (0.027)		
M07_03	M041280	0.023	—	0.731 (0.077)	0.780 (0.082)	0.233 (0.027)		
M07_04	M041059	0.036	—	0.689 (0.030)	-0.315 (0.036)			
M07_05	M041046	0.025	—	1.255 (0.074)	0.176 (0.037)	0.117 (0.017)		
M07_06	M041048	0.021	—	1.309 (0.105)	0.557 (0.044)	0.277 (0.018)		
M07_07	M041169	0.025	—	0.942 (0.069)	0.051 (0.066)	0.205 (0.027)		
M07_08	M041333	0.023	—	0.963 (0.072)	0.565 (0.049)	0.147 (0.019)		
M07_09	M041262	0.022	—	0.799 (0.082)	0.984 (0.068)	0.197 (0.022)		
M07_10	M041267	0.026	—	0.558 (0.029)	0.771 (0.052)			
M07_11	M041177	0.047	—	0.809 (0.055)	-0.472 (0.088)	0.158 (0.035)		
M07_12	M041271	0.048	—	0.860 (0.051)	-0.668 (0.076)	0.115 (0.032)		
M07_13A	M041276A	0.038	—	0.948 (0.038)	0.042 (0.027)			
M07_13B	M041276B	0.025	—	0.885 (0.038)	0.573 (0.032)			

Item	RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
	2015	2019					
Items Common in 2015 and 2019:							
MP01_01	MP51043	0.055	0.042	0.489 (0.017)	-0.065 (0.030)		
MP01_02	MP51040	0.027	0.025	1.162 (0.066)	-0.042 (0.052)	0.422 (0.020)	
MP01_03	MP51008	0.021	0.023	1.270 (0.034)	0.917 (0.018)		
MP01_04A	MP51031A	0.032	0.023	1.449 (0.034)	0.085 (0.013)		
MP01_04B	MP51031B	0.032	0.027	1.619 (0.038)	0.159 (0.012)		
MP01_05	MP51508	0.021	0.024	1.256 (0.030)	0.097 (0.014)		
MP01_06A	MP51216A	0.024	0.019	1.272 (0.062)	0.498 (0.029)	0.237 (0.013)	
MP01_06B	MP51216B	0.051	0.045	0.576 (0.039)	-0.876 (0.174)	0.270 (0.055)	
MP01_07	MP51221	0.053	0.042	0.571 (0.033)	-1.000 (0.144)	0.168 (0.051)	
MP01_08	MP51115	0.036	0.039	0.591 (0.052)	1.613 (0.066)	0.113 (0.017)	
MP01_09A	MP51507A	0.044	0.036	0.704 (0.021)	-0.657 (0.028)		
MP01_09B	MP51507B	0.019	0.019	1.101 (0.030)	0.768 (0.018)		
MP03_01	MP61026	0.054	0.054	0.904 (0.034)	-0.833 (0.053)	0.098 (0.025)	
MP03_02	MP61273	0.031	0.031	0.779 (0.039)	0.241 (0.049)	0.138 (0.020)	
MP03_03	MP61034	0.017	0.029	1.187 (0.030)	0.601 (0.016)		
MP03_04	MP61040	0.032	0.017	1.504 (0.065)	0.590 (0.021)	0.174 (0.010)	
MP03_05	MP61228	0.025	0.029	0.734 (0.015)	0.872 (0.017)		-0.255 (0.027) 0.255 (0.033)
MP03_06	MP61166	0.031	0.042	1.106 (0.027)	-0.356 (0.017)		
MP03_07	MP61171	0.033	0.028	1.310 (0.054)	-0.343 (0.036)	0.231 (0.019)	
MP03_08	MP61080	0.029	0.026	0.765 (0.022)	0.541 (0.022)		
MP03_09	MP61222	0.042	0.030	0.853 (0.056)	0.483 (0.057)	0.323 (0.020)	
MP03_10	MP61076	0.051	0.042	0.553 (0.018)	-0.697 (0.034)		
MP03_11	MP61084	0.024	0.027	1.010 (0.028)	0.777 (0.020)		
MP05_01	MP51206	0.059	0.049	0.591 (0.019)	-0.887 (0.035)		
MP05_02	MP51052	0.036	0.034	0.824 (0.048)	-0.010 (0.070)	0.297 (0.026)	
MP05_03	MP51049	0.032	0.029	1.341 (0.051)	0.037 (0.026)	0.143 (0.013)	
MP05_04	MP51045	0.039	0.039	1.066 (0.026)	-0.109 (0.016)		
MP05_05	MP51098	0.027	0.033	0.990 (0.047)	0.660 (0.030)	0.121 (0.012)	
MP05_06	MP51030	0.038	0.037	0.945 (0.028)	1.093 (0.025)		
MP05_07	MP51502	0.023	0.024	0.961 (0.057)	1.098 (0.035)	0.153 (0.012)	
MP05_08	MP51224	0.036	0.025	0.938 (0.051)	-0.013 (0.058)	0.301 (0.023)	
MP05_09	MP51207	0.019	0.027	0.799 (0.062)	0.794 (0.061)	0.341 (0.019)	
MP05_10	MP51427	0.018	0.023	1.053 (0.050)	0.659 (0.029)	0.136 (0.012)	
MP05_11	MP51533	0.022	0.026	1.056 (0.027)	0.075 (0.016)		
MP05_12	MP51080	0.037	0.034	0.957 (0.025)	-0.162 (0.018)		
MP06_01	MP61018	0.025	0.028	0.860 (0.023)	0.026 (0.019)		
MP06_02	MP61274	0.052	0.047	0.665 (0.037)	-0.686 (0.108)	0.197 (0.040)	
MP06_03	MP61248	0.046	0.039	0.828 (0.019)	0.346 (0.014)		0.401 (0.021) -0.401 (0.023)
MP06_04	MP61039	0.026	0.022	1.068 (0.027)	0.233 (0.016)		
MP06_05	MP61079	0.036	0.027	1.238 (0.031)	0.637 (0.016)		

Item	RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
	2015	2019					
MP06_06	MP61179	0.025	0.026	1.141 (0.047)	-0.023 (0.033)	0.157 (0.016)	
MP06_07	MP61052	0.031	0.024	0.945 (0.038)	0.022 (0.035)	0.091 (0.016)	
MP06_08	MP61207	0.033	0.023	1.429 (0.053)	0.282 (0.021)	0.113 (0.010)	
MP06_09	MP61236	0.043	0.040	0.795 (0.022)	0.182 (0.020)		
MP06_10	MP61266	0.031	0.035	0.466 (0.010)	0.671 (0.021)	-0.844 (0.043)	0.844 (0.047)
MP06_11	MP61106	0.029	0.030	0.974 (0.046)	-0.126 (0.050)	0.219 (0.022)	
MP07_01	MP51401	0.031	0.039	0.784 (0.022)	0.447 (0.021)		
MP07_02	MP51075	0.025	0.025	1.297 (0.088)	1.044 (0.033)	0.326 (0.011)	
MP07_03	MP51402	0.026	0.032	0.917 (0.024)	0.377 (0.018)		
MP07_04	MP51226	0.023	0.020	1.302 (0.067)	0.588 (0.029)	0.270 (0.012)	
MP07_05	MP51131	0.038	0.029	0.731 (0.021)	-0.032 (0.021)		
MP07_06	MP51103	0.020	0.025	1.258 (0.060)	0.174 (0.034)	0.280 (0.016)	
MP07_07	MP51217	0.024	0.020	1.153 (0.029)	0.576 (0.016)		
MP07_08	MP51079	0.024	0.025	0.851 (0.023)	0.257 (0.019)		
MP07_09	MP51211	0.039	0.036	0.783 (0.045)	-0.198 (0.078)	0.274 (0.029)	
MP07_10	MP51102	0.028	0.023	0.948 (0.050)	0.699 (0.034)	0.159 (0.014)	
MP07_11	MP51009	0.048	0.044	0.777 (0.021)	-0.032 (0.020)		
MP07_12	MP51100	0.032	0.028	0.642 (0.041)	0.123 (0.085)	0.195 (0.029)	
MP09_01	MP61275	0.039	0.032	0.709 (0.039)	-0.570 (0.096)	0.212 (0.036)	
MP09_02	MP61027	0.057	0.040	0.893 (0.024)	-0.577 (0.022)		
MP09_03	MP61255	0.026	0.025	0.812 (0.016)	0.483 (0.013)	-0.182 (0.024)	0.182 (0.026)
MP09_04	MP61021	0.024	0.029	0.825 (0.023)	0.621 (0.021)		
MP09_05	MP61043	0.031	0.027	1.232 (0.030)	0.300 (0.014)		
MP09_06	MP61151	0.025	0.029	1.203 (0.046)	-0.159 (0.031)	0.132 (0.016)	
MP09_07	MP61172	0.018	0.028	1.520 (0.065)	0.756 (0.019)	0.123 (0.008)	
MP09_08	MP61223	0.046	0.039	0.725 (0.033)	-0.726 (0.078)	0.119 (0.032)	
MP09_09	MP61269	0.037	0.033	0.851 (0.037)	-0.464 (0.058)	0.130 (0.026)	
MP09_10A	MP61081A	0.030	0.030	1.002 (0.027)	0.721 (0.019)		
MP09_10B	MP61081B	0.039	0.043	0.719 (0.024)	1.055 (0.031)		
MP11_01	MP61178	0.030	0.033	0.829 (0.023)	0.048 (0.019)		
MP11_02	MP61246	0.025	0.027	0.953 (0.038)	0.052 (0.034)	0.090 (0.015)	
MP11_03	MP61271	0.056	0.038	0.618 (0.019)	-0.720 (0.031)		
MP11_04	MP61256	0.038	0.039	0.835 (0.023)	0.125 (0.019)		
MP11_05	MP61182	0.026	0.034	1.210 (0.035)	1.079 (0.021)		
MP11_06	MP61049	0.040	0.029	0.910 (0.048)	-0.482 (0.073)	0.310 (0.029)	
MP11_07	MP61232	0.032	0.035	0.970 (0.063)	0.660 (0.045)	0.321 (0.016)	
MP11_08	MP61095	0.029	0.026	0.915 (0.024)	-0.128 (0.018)		
MP11_09	MP61264	0.036	0.034	0.577 (0.013)	0.389 (0.017)	-0.100 (0.031)	0.100 (0.034)
MP11_10	MP61108	0.033	0.025	0.520 (0.042)	0.554 (0.103)	0.182 (0.032)	
MP11_11A	MP61211A	0.022	0.024	1.222 (0.030)	0.148 (0.014)		
MP11_11B	MP61211B	0.024	0.021	1.512 (0.078)	0.626 (0.026)	0.276 (0.011)	

Item	RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
	2015	2019					
MP13_01	MP61240	0.024	0.022	0.751 (0.022)	0.518 (0.022)		
MP13_02	MP61254	0.045	0.035	0.901 (0.023)	-0.007 (0.018)		
MP13_03	MP61244	0.018	0.030	0.931 (0.044)	-0.161 (0.053)	0.220 (0.023)	
MP13_04	MP61041	0.032	0.029	1.209 (0.072)	0.997 (0.030)	0.242 (0.011)	
MP13_05	MP61173	0.033	0.040	0.706 (0.020)	-0.303 (0.023)		
MP13_06	MP61252	0.027	0.020	1.157 (0.049)	0.590 (0.024)	0.113 (0.011)	
MP13_07	MP61261	0.032	0.036	1.261 (0.030)	0.115 (0.014)		
MP13_08	MP61224	0.031	0.024	0.825 (0.023)	0.541 (0.020)		
MP13_09	MP61077	0.037	0.033	0.830 (0.035)	-0.161 (0.046)	0.093 (0.020)	
MP13_10A	MP61069A	0.036	0.049	0.725 (0.021)	-0.791 (0.028)		
MP13_10B	MP61069B	0.032	0.035	0.732 (0.021)	-0.114 (0.022)		

Items Introduced in 2019:

MP02_01	MP71219	—	0.059	0.709 (0.084)	-1.165 (0.256)	0.032 (0.121)	
MP02_02	MP71021	—	0.033	1.146 (0.110)	0.098 (0.065)	0.089 (0.031)	
MP02_03	MP71167	—	0.027	1.192 (0.081)	0.849 (0.049)		
MP02_04	MP71041	—	0.037	1.375 (0.131)	-0.313 (0.071)	0.143 (0.039)	
MP02_05	MP71162	—	0.033	0.479 (0.029)	1.451 (0.090)		-0.840 (0.112) 0.840 (0.149)
MP02_06	MP71078	—	0.041	0.715 (0.051)	-0.194 (0.054)		
MP02_07	MP71090	—	0.026	1.102 (0.124)	0.183 (0.080)	0.164 (0.037)	
MP02_08	MP71151	—	0.023	0.593 (0.028)	0.897 (0.050)		-1.236 (0.109) 1.236 (0.122)
MP02_09	MP71119	—	0.056	0.589 (0.049)	-1.308 (0.104)		
MP02_10A	MP71217A	—	0.052	0.909 (0.059)	-0.627 (0.052)		
MP02_11	MP71142	—	0.044	1.190 (0.073)	-0.435 (0.040)		
MP02_12	MP71204	—	0.024	1.334 (0.084)	0.475 (0.037)		
MP04_01	MP71013	—	0.033	1.155 (0.143)	-0.260 (0.116)	0.234 (0.056)	
MP04_02	MP71026	—	0.035	1.118 (0.076)	0.161 (0.041)		
MP04_03	MP71036	—	0.051	0.945 (0.067)	-0.538 (0.054)		
MP04_04	MP71040	—	0.021	1.391 (0.146)	0.338 (0.056)	0.103 (0.027)	
MP04_05	MP71068	—	0.034	0.492 (0.118)	0.419 (0.336)	0.113 (0.109)	
MP04_06A	MP71075A	—	0.023	1.256 (0.084)	0.266 (0.038)		
MP04_06B	MP71075B	—	0.024	1.471 (0.103)	0.647 (0.039)		
MP04_07	MP71080	—	0.027	1.595 (0.236)	0.637 (0.069)	0.303 (0.029)	
MP04_08	MP71211	—	0.035	0.632 (0.054)	0.080 (0.066)		
MP04_09	MP71178	—	0.027	0.762 (0.061)	0.508 (0.062)		
MP04_10B	MP71135B	—	0.036	0.681 (0.056)	-0.549 (0.072)		
MP04_11	MP71201	—	0.027	0.787 (0.069)	0.987 (0.080)		
MP04_12	MP71175	—	0.035	0.801 (0.052)	-0.085 (0.040)		0.560 (0.068) -0.560 (0.062)
MP08_01	MP71018	—	0.036	1.371 (0.140)	0.177 (0.060)	0.160 (0.029)	
MP08_02	MP71009	—	0.045	1.248 (0.075)	0.209 (0.035)		
MP08_03	MP71037	—	0.035	0.908 (0.058)	0.158 (0.045)		
MP08_04	MP71051	—	0.025	1.170 (0.081)	0.913 (0.052)		

Item	RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
	2015	2019					
MP08_05	MP71064	—	0.044	0.724 (0.122)	0.756 (0.124)	0.155 (0.045)	
MP08_06	MP71169	—	0.029	1.317 (0.082)	0.506 (0.037)		
MP08_07	MP71083	—	0.040	1.202 (0.150)	0.507 (0.072)	0.209 (0.030)	
MP08_09	MP71184	—	0.027	1.635 (0.258)	1.059 (0.064)	0.244 (0.020)	
MP08_10	MP71141	—	0.029	0.957 (0.066)	0.733 (0.054)		
MP08_11	MP71194	—	0.086	0.743 (0.056)	-1.035 (0.074)		
MP08_12	MP71193	—	0.033	0.585 (0.028)	0.449 (0.043)	-0.802 (0.092)	0.802 (0.100)
MP08_13	MP71192	—	0.018	0.499 (0.024)	0.947 (0.057)	-2.150 (0.161)	2.150 (0.173)
MP10_02	MP71016	—	0.024	0.949 (0.066)	-0.049 (0.047)		
MP10_03	MP71163	—	0.027	1.762 (0.208)	0.966 (0.048)	0.076 (0.015)	
MP10_04	MP71045	—	0.024	1.087 (0.135)	0.257 (0.087)	0.163 (0.040)	
MP10_05	MP71213	—	0.024	0.941 (0.069)	0.435 (0.051)		
MP10_06	MP71070	—	0.038	0.354 (0.108)	-0.609 (1.060)	0.021 (0.287)	
MP10_07	MP71181	—	0.026	0.733 (0.060)	0.629 (0.068)		
MP10_08	MP71179	—	0.021	0.852 (0.072)	1.061 (0.078)		
MP10_09	MP71067	—	0.032	0.543 (0.028)	0.961 (0.058)	-1.542 (0.138)	1.542 (0.152)
MP10_10A	MP71147A	—	0.041	1.302 (0.087)	-0.429 (0.042)		
MP10_10B	MP71147B	—	0.026	0.886 (0.066)	0.298 (0.052)		
MP10_11	MP71189	—	0.056	0.903 (0.072)	-1.359 (0.088)		
MP10_12A	MP71187A	—	0.048	0.813 (0.063)	-0.932 (0.076)		
MP10_12B	MP71187B	—	0.060	0.676 (0.056)	-0.354 (0.068)		
MP12_01	MP71001	—	0.050	0.857 (0.103)	-1.079 (0.211)	0.087 (0.107)	
MP12_02	MP71010	—	0.039	0.694 (0.055)	-0.186 (0.062)		
MP12_03	MP71062	—	0.027	1.337 (0.208)	1.169 (0.073)	0.129 (0.021)	
MP12_04A	MP71216A	—	0.032	1.253 (0.082)	-0.382 (0.042)		
MP12_04B	MP71216B	—	0.037	0.831 (0.065)	0.295 (0.057)		
MP12_05	MP71117	—	0.035	0.646 (0.053)	-0.414 (0.070)		
MP12_06	MP71071	—	0.022	1.248 (0.198)	0.517 (0.094)	0.332 (0.037)	
MP12_07	MP71098	—	0.028	0.729 (0.047)	0.762 (0.048)	0.060 (0.068)	-0.060 (0.086)
MP12_08A	MP71134A	—	0.030	1.769 (0.165)	-0.046 (0.047)	0.092 (0.026)	
MP12_08B	MP71134B	—	0.036	1.454 (0.097)	0.254 (0.035)		
MP12_09	MP71202	—	0.036	0.681 (0.057)	-0.492 (0.071)		
MP12_10	MP71190	—	0.026	1.052 (0.073)	-0.112 (0.045)		
MP12_11	MP71218	—	0.025	1.098 (0.094)	1.196 (0.072)		
MP14_01	MP71024	—	0.025	0.921 (0.066)	0.160 (0.048)		
MP14_02	MP71008	—	0.028	1.118 (0.123)	-0.198 (0.095)	0.128 (0.047)	
MP14_03	MP71165	—	0.022	1.277 (0.154)	0.200 (0.076)	0.190 (0.037)	
MP14_04	MP71049	—	0.041	0.805 (0.060)	-0.370 (0.057)		
MP14_05	MP71063	—	0.028	1.050 (0.073)	0.220 (0.044)		
MP14_06	MP71079	—	0.019	1.179 (0.170)	0.696 (0.078)	0.192 (0.032)	
MP14_07	MP71081	—	0.034	1.007 (0.069)	-0.105 (0.046)		

Item	RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
	2015	2019					
MP14_08	MP71094	—	0.024	1.007 (0.175)	0.648 (0.111)	0.280 (0.041)	
MP14_09	MP71177	—	0.029	0.606 (0.054)	0.389 (0.073)		
MP14_10	MP71206	—	0.042	0.681 (0.105)	-0.620 (0.282)	0.125 (0.114)	
MP14_11A	MP71138A	—	0.029	0.798 (0.060)	0.032 (0.054)		
MP14_11B	MP71138B	—	0.022	0.984 (0.076)	0.747 (0.058)		
MP14_12	MP71203	—	0.028	0.653 (0.139)	1.178 (0.143)	0.106 (0.047)	
MP14_13	MP71205	—	0.024	1.108 (0.079)	0.366 (0.044)		

Appendix 12B: Science Item Parameters from the paperTIMSS 2019 Concurrent Calibration— Grade 4

Item		RMSD		Slope (a _i)	Location (b _i)	Guessing (c _i)	Step 1 (d _{i1})	Step 2 (d _{i2})
		2015	2019					
Items Released in 2015:								
S01_01	S041010	0.044	—	0.967 (0.067)	-0.786 (0.093)	0.259 (0.038)		
S01_02	S041034	0.034	—	0.647 (0.064)	-0.096 (0.134)	0.274 (0.042)		
S01_03	S041017	0.021	—	0.963 (0.108)	1.018 (0.061)	0.249 (0.021)		
S01_04	S041124	0.024	—	1.020 (0.102)	0.812 (0.057)	0.263 (0.022)		
S01_05	S041186	0.031	—	0.638 (0.036)	1.080 (0.057)			
S01_06	S041037	0.040	—	0.543 (0.020)	-0.186 (0.028)		-0.129 (0.055)	0.129 (0.050)
S01_07	S041119	0.028	—	1.115 (0.095)	-0.024 (0.076)	0.400 (0.029)		
S01_08	S041105	0.039	—	0.933 (0.060)	-0.130 (0.060)	0.141 (0.026)		
S01_10Z	S041149Z	0.024	—	0.606 (0.019)	1.033 (0.032)		-1.084 (0.062)	1.084 (0.072)
S01_11	S041032	0.079	—	0.827 (0.038)	-1.450 (0.061)			
S01_12	S041068	0.030	—	0.715 (0.035)	0.250 (0.033)			
S01_13	S041303	0.026	—	0.676 (0.085)	0.799 (0.102)	0.272 (0.033)		
S02_01	S061105	0.028	—	0.701 (0.078)	0.107 (0.135)	0.383 (0.039)		
S02_02	S061010	0.041	—	0.419 (0.026)	0.038 (0.053)			
S02_03	S061028	0.020	—	0.843 (0.119)	1.177 (0.083)	0.321 (0.024)		
S02_04	S061065	0.039	—	1.003 (0.067)	-0.227 (0.065)	0.198 (0.029)		
S02_05	S061130	0.031	—	0.797 (0.037)	0.420 (0.031)			
S02_06	S061081	0.028	—	0.926 (0.044)	0.828 (0.034)			
S02_07	S061060	0.041	—	0.829 (0.036)	-0.010 (0.030)			
S02_08	S061075	0.043	—	0.604 (0.050)	-0.260 (0.117)	0.145 (0.039)		
S02_09	S061031	0.034	—	0.992 (0.046)	0.875 (0.033)			
S02_10A	S061049A	0.047	—	0.773 (0.050)	-0.348 (0.074)	0.105 (0.028)		
S02_10B	S061049B	0.031	—	0.618 (0.057)	0.244 (0.101)	0.159 (0.034)		
S02_11	S061098	0.019	—	0.757 (0.105)	1.217 (0.088)	0.264 (0.026)		
S02_12	S061172	0.023	—	0.566 (0.034)	1.057 (0.061)			
S03_01	S051041	0.022	—	0.862 (0.098)	0.675 (0.081)	0.348 (0.027)		
S03_02	S051037	0.042	—	0.787 (0.035)	0.038 (0.031)			
S03_03	S051008	0.024	—	0.870 (0.045)	1.141 (0.046)			
S03_04	S051004	0.034	—	1.361 (0.088)	-0.099 (0.048)	0.248 (0.024)		
S03_05Z	S051026Z	0.028	—	0.532 (0.031)	0.752 (0.052)			
S03_06	S051130	0.022	—	0.530 (0.035)	1.478 (0.088)			
S03_07	S051114	0.024	—	1.155 (0.098)	0.607 (0.049)	0.251 (0.021)		
S03_08Z	S051121Z	0.045	—	0.414 (0.026)	0.097 (0.054)			
S03_09	S051147	0.027	—	0.841 (0.043)	0.978 (0.041)			
S03_10	S051105	0.031	—	1.005 (0.082)	-0.115 (0.081)	0.339 (0.032)		
S03_11	S051110	0.033	—	0.871 (0.066)	0.052 (0.072)	0.195 (0.029)		
S03_12	S051111	0.021	—	1.114 (0.101)	0.299 (0.068)	0.374 (0.027)		

Item		RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
		2015	2019					
S05_01	S041009	0.044	—	0.774 (0.059)	-0.931 (0.127)	0.246 (0.045)		
S05_02	S041223	0.028	—	1.000 (0.091)	0.432 (0.064)	0.297 (0.025)		
S05_03	S041026	0.037	—	0.536 (0.051)	0.222 (0.111)	0.126 (0.035)		
S05_04	S041177	0.026	—	0.424 (0.022)	1.054 (0.051)		0.377 (0.058)	-0.377 (0.078)
S05_05	S041183	0.052	—	0.646 (0.021)	0.207 (0.028)		1.136 (0.044)	-1.136 (0.045)
S05_06	S041008	0.026	—	1.171 (0.101)	0.666 (0.046)	0.237 (0.020)		
S05_08	S041195	0.018	—	0.618 (0.042)	1.664 (0.093)			
S05_09A	S041134A	0.028	—	0.804 (0.041)	0.953 (0.043)			
S05_09B	S041134B	0.045	—	0.768 (0.035)	0.162 (0.031)			
S05_09C	S041134C	0.025	—	0.756 (0.069)	0.471 (0.074)	0.184 (0.028)		
S05_10	S041191	0.024	—	0.841 (0.100)	0.802 (0.078)	0.309 (0.026)		
S05_11	S041107	0.047	—	0.394 (0.014)	-0.825 (0.047)		-0.797 (0.089)	0.797 (0.075)
S05_12	S041113	0.028	—	0.755 (0.037)	0.398 (0.033)			
S06_01	S051185	0.028	—	1.044 (0.075)	0.365 (0.048)	0.170 (0.021)		
S06_02	S051048	0.039	—	0.670 (0.025)	0.058 (0.023)		0.255 (0.043)	-0.255 (0.041)
S06_03	S051164	0.040	—	0.839 (0.051)	1.575 (0.072)			
S06_04	S051186	0.045	—	0.635 (0.030)	-1.065 (0.058)			
S06_05	S051137	0.050	—	0.661 (0.048)	-1.053 (0.139)	0.163 (0.047)		
S06_06	S051007	0.033	—	0.835 (0.036)	-0.131 (0.031)			
S06_07	S051087	0.032	—	1.020 (0.071)	-0.533 (0.080)	0.258 (0.034)		
S06_08Z	S051188Z	0.029	—	0.597 (0.031)	0.255 (0.039)			
S06_10	S051201	0.036	—	0.663 (0.033)	0.381 (0.036)			
S06_11	S051102	0.024	—	0.815 (0.068)	0.035 (0.085)	0.235 (0.032)		
S06_12	S051095	0.053	—	0.540 (0.028)	-0.429 (0.049)			
S07_01	S041027	0.074	—	0.715 (0.035)	-1.989 (0.083)			
S07_02	S041043	0.048	—	0.608 (0.030)	-0.664 (0.049)			
S07_03	S041050	0.025	—	0.459 (0.060)	0.656 (0.157)	0.181 (0.044)		
S07_04	S041070	0.025	—	0.797 (0.072)	0.411 (0.075)	0.212 (0.029)		
S07_05	S041006	0.037	—	0.453 (0.021)	0.601 (0.036)		0.354 (0.056)	-0.354 (0.065)
S07_06	S041052	0.027	—	0.918 (0.075)	-0.432 (0.103)	0.349 (0.038)		
S07_07	S041301	0.025	—	0.569 (0.033)	0.822 (0.052)			
S07_09	S041033	0.025	—	0.854 (0.043)	1.000 (0.042)			
S07_11	S041077	0.032	—	0.745 (0.035)	0.328 (0.033)			
S07_12	S041209	0.028	—	0.689 (0.070)	0.690 (0.080)	0.167 (0.029)		
S07_13	S041081	0.030	—	0.540 (0.019)	0.495 (0.028)		-0.440 (0.055)	0.440 (0.059)
S07_14	S041102	0.028	—	0.941 (0.070)	-0.248 (0.081)	0.244 (0.034)		

Item	RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
	2015	2019					
Items Common in 2015 and 2019:							
SP01_01	SP51054	0.049	0.035	0.934 (0.044)	-0.419 (0.058)	0.261 (0.024)	
SP01_02	SP51024	0.038	0.034	0.612 (0.021)	0.674 (0.028)		
SP01_03A	SP51132A	0.026	0.015	0.881 (0.031)	1.254 (0.032)		
SP01_03B	SP51132B	0.039	0.031	0.810 (0.027)	1.065 (0.029)		
SP01_04	SP51040	0.030	0.037	0.453 (0.018)	0.606 (0.036)		
SP01_05	SP51193	0.033	0.037	0.940 (0.048)	-0.126 (0.053)	0.274 (0.022)	
SP01_06	SP51063	0.018	0.029	1.148 (0.066)	0.754 (0.030)	0.222 (0.013)	
SP01_07	SP51012	0.027	0.029	0.989 (0.052)	0.268 (0.042)	0.253 (0.018)	
SP01_08	SP51115	0.054	0.032	1.090 (0.028)	0.146 (0.015)		
SP01_09	SP51180	0.034	0.037	0.880 (0.054)	0.057 (0.064)	0.360 (0.022)	
SP01_10	SP51106	0.018	0.026	1.024 (0.061)	0.721 (0.034)	0.215 (0.014)	
SP01_11	SP51148	0.025	0.038	1.049 (0.050)	0.043 (0.041)	0.241 (0.018)	
SP03_01	SP61141	0.028	0.021	1.235 (0.068)	0.519 (0.032)	0.300 (0.014)	
SP03_02	SP61023	0.034	0.035	0.770 (0.022)	0.015 (0.020)		
SP03_03	SP61054	0.046	0.042	0.479 (0.010)	0.643 (0.024)	1.489 (0.034)	-1.489 (0.043)
SP03_04	SP61007	0.040	0.035	0.647 (0.036)	-0.209 (0.079)	0.163 (0.028)	
SP03_05	SP61006	0.056	0.047	0.785 (0.022)	-0.650 (0.026)		
SP03_06	SP61108	0.025	0.026	1.050 (0.061)	0.233 (0.047)	0.352 (0.018)	
SP03_07	SP61109	0.029	0.032	0.583 (0.050)	0.710 (0.081)	0.235 (0.026)	
SP03_08	SP61080	0.024	0.024	0.968 (0.053)	0.297 (0.044)	0.264 (0.018)	
SP03_09	SP61088	0.028	0.017	0.672 (0.026)	1.417 (0.046)		
SP03_10	SP61151	0.033	0.031	0.952 (0.026)	0.440 (0.017)		
SP03_11	SP61150	0.045	0.043	0.624 (0.021)	0.408 (0.025)		
SP03_12	SP61169	0.024	0.032	1.077 (0.053)	0.079 (0.041)	0.268 (0.018)	
SP05_01	SP51044	0.034	0.035	0.503 (0.018)	0.201 (0.028)		
SP05_03	SP51003	0.044	0.038	0.711 (0.034)	-0.122 (0.054)	0.104 (0.021)	
SP05_04	SP51168	0.066	0.060	0.704 (0.021)	-0.475 (0.026)		
SP05_05	SP51010	0.039	0.038	0.766 (0.022)	0.076 (0.020)		
SP05_06	SP51035	0.024	0.030	1.249 (0.101)	1.298 (0.037)	0.236 (0.010)	
SP05_07	SP51059	0.035	0.035	0.584 (0.020)	0.104 (0.025)		
SP05_08	SP51142	0.036	0.023	0.802 (0.050)	0.598 (0.046)	0.199 (0.018)	
SP05_09A	SP51131A	0.030	0.034	1.014 (0.045)	-0.089 (0.041)	0.193 (0.019)	
SP05_09B	SP51131B	0.023	0.030	0.988 (0.055)	0.576 (0.035)	0.197 (0.015)	
SP05_10	SP51151	0.063	0.058	0.918 (0.026)	-1.120 (0.030)		
SP05_11	SP51157	0.030	0.022	0.739 (0.057)	0.999 (0.049)	0.190 (0.017)	
SP06_01	SP61071	0.051	0.043	0.335 (0.028)	-1.372 (0.337)	0.197 (0.071)	
SP06_02	SP61138	0.055	0.046	0.616 (0.020)	0.002 (0.024)		
SP06_03A	SP61016A	0.032	0.025	0.926 (0.050)	0.365 (0.041)	0.216 (0.017)	
SP06_03B	SP61016B	0.038	0.037	0.990 (0.027)	0.509 (0.017)		
SP06_04	SP61011	0.059	0.050	0.733 (0.021)	-0.536 (0.026)		

Item	RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
	2015	2019					
SP06_06	SP61083	0.055	0.051	0.726 (0.021)	-1.025 (0.034)		
SP06_07	SP61034	0.026	0.028	0.788 (0.027)	1.088 (0.030)		
SP06_08	SP61044	0.030	0.030	0.740 (0.023)	0.551 (0.022)		
SP06_09A	SP61142A	0.034	0.034	0.623 (0.021)	0.351 (0.024)		
SP06_09B	SP61142B	0.027	0.026	0.788 (0.027)	1.034 (0.029)		
SP06_10A	SP61115A	0.033	0.031	1.468 (0.068)	0.346 (0.026)	0.264 (0.013)	
SP06_10B	SP61115B	0.037	0.028	1.345 (0.081)	0.662 (0.030)	0.328 (0.013)	
SP07_01	SP51161	0.036	0.032	0.488 (0.051)	1.007 (0.099)	0.217 (0.029)	
SP07_02	SP51051	0.027	0.021	1.391 (0.122)	1.370 (0.037)	0.281 (0.009)	
SP07_03Z	SP51138Z	0.033	0.034	0.583 (0.020)	0.313 (0.025)		
SP07_04	SP51194	0.024	0.027	0.970 (0.030)	1.014 (0.024)		
SP07_05	SP51029	0.022	0.023	0.518 (0.055)	1.220 (0.083)	0.202 (0.026)	
SP07_06	SP51077	0.046	0.041	0.747 (0.022)	-0.167 (0.022)		
SP07_07	SP51200	0.023	0.030	0.679 (0.025)	1.196 (0.037)		
SP07_08	SP51075	0.062	0.052	0.670 (0.020)	-0.586 (0.029)		
SP07_09	SP51065	0.037	0.041	0.870 (0.049)	-0.215 (0.070)	0.333 (0.026)	
SP07_10	SP51191	0.024	0.033	1.342 (0.065)	0.578 (0.025)	0.205 (0.012)	
SP07_11	SP51099	0.024	0.027	0.868 (0.049)	0.332 (0.047)	0.216 (0.019)	
SP07_12	SP51175	0.020	0.031	0.978 (0.030)	0.968 (0.023)		
SP09_01	SP61135	0.050	0.036	0.758 (0.041)	-0.598 (0.085)	0.268 (0.030)	
SP09_02	SP61069	0.044	0.041	0.400 (0.016)	-0.481 (0.041)		
SP09_03	SP61134	0.039	0.038	0.651 (0.036)	0.181 (0.060)	0.126 (0.022)	
SP09_04	SP61140	0.029	0.024	1.039 (0.064)	0.601 (0.039)	0.296 (0.016)	
SP09_05	SP61019	0.024	0.028	0.887 (0.028)	0.943 (0.024)		
SP09_06	SP61022	0.028	0.030	0.656 (0.044)	0.183 (0.079)	0.241 (0.026)	
SP09_07	SP61036	0.029	0.028	0.951 (0.029)	0.903 (0.022)		
SP09_08	SP61160	0.052	0.051	0.761 (0.022)	-0.954 (0.032)		
SP09_09	SP61159	0.063	0.054	0.826 (0.023)	-0.788 (0.027)		
SP09_10	SP61091	0.029	0.031	0.452 (0.014)	1.170 (0.032)	-0.176 (0.038)	0.176 (0.050)
SP09_11	SP61118	0.020	0.029	1.001 (0.056)	0.542 (0.036)	0.217 (0.016)	
SP09_12	SP61097	0.024	0.028	0.798 (0.055)	0.517 (0.056)	0.275 (0.021)	
SP11_01	SP61132	0.028	0.023	0.710 (0.048)	0.539 (0.058)	0.213 (0.021)	
SP11_02	SP61120	0.028	0.028	0.884 (0.047)	0.333 (0.043)	0.197 (0.018)	
SP11_03	SP61025	0.041	0.041	0.531 (0.018)	-0.366 (0.031)		
SP11_04A	SP61133A	0.028	0.023	1.370 (0.067)	0.245 (0.032)	0.326 (0.015)	
SP11_04B	SP61133B	0.028	0.030	1.701 (0.073)	0.792 (0.016)	0.114 (0.008)	
SP11_05	SP61074	0.044	0.035	0.772 (0.023)	0.219 (0.020)		
SP11_06	SP61093	0.063	0.056	0.761 (0.016)	-0.057 (0.016)	0.937 (0.026)	-0.937 (0.022)
SP11_07	SP61161	0.034	0.032	0.614 (0.021)	0.664 (0.028)		
SP11_08A	SP61042A	0.020	0.024	1.366 (0.077)	0.806 (0.025)	0.239 (0.011)	
SP11_08B	SP61042B	0.022	0.029	0.791 (0.047)	0.640 (0.042)	0.150 (0.017)	

Item	RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
	2015	2019					
SP11_09A	SP61041A	0.032	0.033	0.871 (0.024)	0.116 (0.018)		
SP11_09B	SP61041B	0.044	0.041	0.719 (0.022)	0.167 (0.021)		
SP11_10	SP61155	0.044	0.040	0.735 (0.043)	-0.488 (0.093)	0.286 (0.032)	
SP13_02	SP61014	0.039	0.036	0.495 (0.018)	0.425 (0.030)		
SP13_03	SP61056	0.068	0.060	0.853 (0.023)	-0.738 (0.026)		
SP13_04	SP61015	0.060	0.055	0.692 (0.020)	-0.395 (0.025)		
SP13_05	SP61113	0.036	0.024	0.760 (0.025)	0.954 (0.028)		
SP13_06	SP61107	0.020	0.032	1.001 (0.054)	0.641 (0.032)	0.180 (0.014)	
SP13_07	SP61046	0.019	0.030	1.164 (0.068)	0.804 (0.029)	0.227 (0.012)	
SP13_08	SP61047	0.042	0.043	0.751 (0.043)	-0.518 (0.089)	0.313 (0.030)	
SP13_09	SP61048	0.027	0.032	1.300 (0.062)	0.509 (0.026)	0.221 (0.012)	
SP13_10	SP61096	0.029	0.019	1.100 (0.066)	0.730 (0.033)	0.257 (0.014)	
SP13_11	SP61124	0.026	0.028	0.590 (0.023)	1.242 (0.043)		
SP13_12	SP61116	0.039	0.031	0.681 (0.021)	0.159 (0.022)		

Items Introduced in 2019:

SP02_01	SP71002	—	0.046	0.572 (0.047)	0.043 (0.065)		
SP02_02	SP71402	—	0.048	1.119 (0.135)	-0.253 (0.108)	0.299 (0.045)	
SP02_03	SP71017	—	0.035	0.710 (0.054)	0.271 (0.056)		
SP02_04	SP71077	—	0.036	1.100 (0.071)	0.226 (0.038)		
SP02_05	SP71072	—	0.022	1.212 (0.186)	0.786 (0.072)	0.232 (0.027)	
SP02_06	SP71054	—	0.042	0.941 (0.064)	0.213 (0.043)		
SP02_07	SP71115	—	0.028	0.848 (0.159)	0.797 (0.110)	0.249 (0.039)	
SP02_08	SP71140	—	0.043	0.703 (0.110)	-0.071 (0.182)	0.240 (0.062)	
SP02_09	SP71128	—	0.040	0.852 (0.133)	0.016 (0.152)	0.330 (0.052)	
SP02_10	SP71147	—	0.044	0.883 (0.113)	-0.224 (0.134)	0.241 (0.052)	
SP02_11A	SP71920A	—	0.038	0.802 (0.059)	0.344 (0.052)		
SP02_11B	SP71920B	—	0.031	0.956 (0.070)	0.612 (0.051)		
SP02_12	SP71268	—	0.023	0.941 (0.204)	1.253 (0.119)	0.203 (0.029)	
SP04_01	SP71013	—	0.049	0.852 (0.106)	-0.766 (0.181)	0.278 (0.067)	
SP04_02	SP71902	—	0.031	0.272 (0.040)	1.509 (0.259)		
SP04_03	SP71076	—	0.050	0.860 (0.091)	-0.563 (0.126)	0.134 (0.052)	
SP04_04	SP71041	—	0.036	0.778 (0.049)	0.977 (0.050)	0.021 (0.060)	-0.021 (0.084)
SP04_05	SP71046	—	0.033	0.803 (0.059)	0.442 (0.053)		
SP04_06	SP71095	—	0.040	0.654 (0.051)	0.225 (0.059)		
SP04_07	SP71129	—	0.042	0.855 (0.118)	-0.617 (0.192)	0.346 (0.066)	
SP04_08	SP71102	—	0.032	0.751 (0.059)	0.669 (0.064)		
SP04_09	SP71124	—	0.031	1.132 (0.159)	0.510 (0.079)	0.252 (0.032)	
SP04_10	SP71112	—	0.062	0.743 (0.094)	-1.183 (0.243)	0.216 (0.090)	
SP04_11	SP71265	—	0.030	0.708 (0.157)	0.628 (0.170)	0.341 (0.052)	
SP04_12	SP71223	—	0.059	0.548 (0.100)	-1.573 (0.565)	0.298 (0.161)	
SP08_02	SP71033	—	0.038	0.544 (0.123)	0.276 (0.275)	0.289 (0.076)	

Item	RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
	2015	2019					
SP08_03	SP71065	—	0.049	0.670 (0.048)	-0.637 (0.066)		
SP08_04	SP71025	—	0.043	0.270 (0.095)	-0.329 (1.177)	0.000 (0.251)	
SP08_05	SP71081	—	0.027	0.949 (0.162)	1.051 (0.091)	0.157 (0.027)	
SP08_06	SP71056	—	0.034	0.635 (0.055)	0.853 (0.083)		
SP08_07	SP71145	—	0.046	0.516 (0.094)	-0.290 (0.313)	0.181 (0.091)	
SP08_08	SP71104	—	0.067	0.795 (0.053)	-0.850 (0.064)		
SP08_09	SP71144	—	0.044	0.515 (0.083)	-0.087 (0.229)	0.081 (0.073)	
SP08_10	SP71150	—	0.046	1.055 (0.065)	-0.402 (0.044)		
SP08_11	SP71201	—	0.031	1.048 (0.133)	-0.026 (0.106)	0.285 (0.043)	
SP08_12	SP71237	—	0.044	1.086 (0.070)	0.213 (0.039)		
SP08_13	SP71260	—	0.024	0.735 (0.145)	1.105 (0.119)	0.151 (0.036)	
SP10_01	SP71009	—	0.073	0.591 (0.033)	-0.470 (0.049)	1.127 (0.086)	-1.127 (0.069)
SP10_02	SP71093	—	0.049	0.727 (0.050)	-0.409 (0.057)		
SP10_03	SP71069	—	0.028	0.946 (0.213)	1.140 (0.118)	0.295 (0.032)	
SP10_04	SP71051	—	0.029	0.748 (0.058)	0.622 (0.062)		
SP10_05	SP71039	—	0.034	0.766 (0.101)	0.150 (0.117)	0.147 (0.045)	
SP10_06	SP71080	—	0.026	0.929 (0.170)	0.928 (0.099)	0.235 (0.033)	
SP10_07	SP71137	—	0.063	0.705 (0.050)	-0.283 (0.057)		
SP10_08	SP71103	—	0.035	0.815 (0.127)	0.275 (0.130)	0.259 (0.046)	
SP10_09	SP71106	—	0.040	0.629 (0.051)	0.442 (0.067)		
SP10_10	SP71100	—	0.029	0.910 (0.155)	0.275 (0.136)	0.374 (0.045)	
SP10_12	SP71220	—	0.030	0.998 (0.160)	0.732 (0.088)	0.232 (0.033)	
SP10_13	SP71254	—	0.030	0.704 (0.057)	0.652 (0.068)		
SP12_01	SP71031	—	0.043	0.630 (0.048)	0.021 (0.060)		
SP12_02	SP71090	—	0.041	0.767 (0.053)	0.011 (0.051)		
SP12_03	SP71048	—	0.024	1.433 (0.269)	1.191 (0.078)	0.220 (0.021)	
SP12_04	SP71071	—	0.028	0.990 (0.075)	0.875 (0.058)		
SP12_05	SP71011	—	0.045	1.209 (0.119)	-0.421 (0.085)	0.193 (0.040)	
SP12_06	SP71142	—	0.037	0.826 (0.149)	0.493 (0.133)	0.323 (0.044)	
SP12_07	SP71138	—	0.055	0.771 (0.052)	-0.619 (0.059)		
SP12_08	SP71127	—	0.040	0.920 (0.127)	0.034 (0.123)	0.288 (0.045)	
SP12_10	SP71500	—	0.035	0.792 (0.106)	0.333 (0.103)	0.140 (0.040)	
SP12_11	SP71257	—	0.033	1.395 (0.431)	1.384 (0.132)	0.431 (0.023)	
SP12_12	SP71222	—	0.038	0.906 (0.062)	0.231 (0.045)		
SP12_13	SP71252	—	0.030	0.988 (0.146)	0.352 (0.104)	0.290 (0.039)	
SP14_01	SP71063	—	0.050	0.407 (0.040)	-0.311 (0.090)		
SP14_02	SP71900	—	0.036	1.029 (0.149)	-0.022 (0.125)	0.373 (0.046)	
SP14_04	SP71043	—	0.024	0.644 (0.065)	1.381 (0.127)		
SP14_05	SP71005	—	0.062	1.021 (0.065)	-0.584 (0.049)		
SP14_06	SP71118	—	0.028	1.130 (0.170)	0.827 (0.073)	0.188 (0.027)	
SP14_07	SP71139	—	0.041	0.952 (0.143)	0.007 (0.135)	0.359 (0.048)	

Item		RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
		2015	2019					
SP14_08	SP71114	—	0.059	0.784 (0.054)	-0.391 (0.054)			
SP14_09	SP71131	—	0.050	0.577 (0.047)	-0.028 (0.065)			
SP14_10	SP71152	—	0.029	1.235 (0.178)	0.479 (0.078)	0.300 (0.033)		
SP14_11	SP71218	—	0.056	0.795 (0.112)	-0.626 (0.205)	0.309 (0.070)		
SP14_12	SP71214	—	0.037	1.098 (0.123)	0.119 (0.076)	0.167 (0.035)		
SP14_13	SP71213	—	0.034	1.005 (0.081)	0.950 (0.063)			

Appendix 12C: Mathematics Item Parameters from the paperTIMSS 2019 Concurrent Calibration—Grade 8

Item		RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
		2015	2019					
Items Released in 2015:								
M01_01	M042182	0.018	—	1.565 (0.137)	0.177 (0.053)	0.360 (0.022)		
M01_02	M042081	0.032	—	0.838 (0.040)	0.581 (0.038)			
M01_03	M042049	0.038	—	1.031 (0.088)	-0.045 (0.083)	0.261 (0.034)		
M01_04	M042052	0.030	—	1.712 (0.106)	-0.132 (0.035)	0.126 (0.019)		
M01_05	M042076	0.031	—	1.049 (0.087)	0.408 (0.059)	0.179 (0.024)		
M01_06A	M042302A	0.026	—	0.987 (0.032)	0.317 (0.021)		-0.175 (0.039)	0.175 (0.041)
M01_06B	M042302B	0.027	—	0.984 (0.029)	0.411 (0.020)		-0.617 (0.048)	0.617 (0.050)
M01_06C	M042302C	0.035	—	0.510 (0.022)	1.723 (0.066)		-1.007 (0.087)	1.007 (0.115)
M01_07	M042100	0.031	—	1.181 (0.097)	0.042 (0.066)	0.258 (0.028)		
M01_08	M042202	0.017	—	1.471 (0.121)	0.392 (0.047)	0.260 (0.020)		
M01_09	M042240	0.025	—	1.319 (0.090)	0.131 (0.045)	0.141 (0.021)		
M01_10	M042093	0.022	—	1.710 (0.086)	1.091 (0.029)			
M01_11	M042271	0.028	—	1.111 (0.079)	0.156 (0.054)	0.132 (0.023)		
M01_12	M042268	0.017	—	1.519 (0.140)	1.053 (0.041)	0.168 (0.013)		
M01_13	M042159	0.075	—	0.453 (0.029)	-0.917 (0.075)			
M01_14	M042164	0.023	—	1.451 (0.062)	0.424 (0.025)			
M01_15	M042167	0.012	—	1.380 (0.064)	0.757 (0.029)			
M02_01	M062208	0.044	—	0.983 (0.042)	-0.180 (0.031)			
M02_02	M062153	0.024	—	0.897 (0.086)	0.495 (0.077)	0.210 (0.029)		
M02_03A	M062111A	0.033	—	1.326 (0.054)	0.095 (0.025)			
M02_03B	M062111B	0.018	—	1.673 (0.073)	0.591 (0.023)			
M02_04	M062237	0.018	—	1.636 (0.080)	1.024 (0.029)			
M02_05	M062314	0.023	—	1.072 (0.054)	1.182 (0.043)			
M02_06	M062074	0.021	—	0.908 (0.119)	1.172 (0.080)	0.276 (0.023)		
M02_07	M062183	0.031	—	0.949 (0.042)	0.245 (0.032)			
M02_08	M062202	0.039	—	1.136 (0.085)	-0.106 (0.066)	0.196 (0.030)		
M02_09	M062246	0.017	—	2.108 (0.194)	1.073 (0.033)	0.172 (0.011)		
M02_10	M062286	0.018	—	1.095 (0.044)	1.329 (0.031)		-0.179 (0.043)	0.179 (0.057)
M02_11	M062325	0.019	—	0.896 (0.126)	1.034 (0.093)	0.366 (0.025)		
M02_12	M062106	0.041	—	0.425 (0.064)	0.789 (0.222)	0.177 (0.057)		
M02_13	M062124	0.020	—	1.455 (0.103)	0.516 (0.037)	0.123 (0.015)		
M03_01	M052209	0.041	—	1.397 (0.091)	-0.170 (0.046)	0.148 (0.024)		
M03_02	M052142	0.028	—	1.004 (0.088)	0.761 (0.055)	0.145 (0.020)		
M03_03	M052006	0.016	—	1.266 (0.131)	0.939 (0.054)	0.273 (0.018)		
M03_04	M052035	0.029	—	1.480 (0.061)	0.249 (0.023)			
M03_05	M052016	0.036	—	1.467 (0.061)	0.367 (0.024)			
M03_06	M052064	0.025	—	1.296 (0.109)	0.512 (0.050)	0.233 (0.020)		

Item		RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
		2015	2019					
M03_07	M052126	0.017	—	1.790 (0.089)	1.067 (0.028)			
M03_08	M052103	0.040	—	0.964 (0.070)	0.063 (0.064)	0.122 (0.027)		
M03_09	M052066	0.026	—	1.304 (0.103)	0.367 (0.049)	0.213 (0.021)		
M03_10	M052041	0.034	—	1.226 (0.063)	1.273 (0.042)			
M03_11	M052057	0.053	—	0.661 (0.060)	-0.008 (0.124)	0.150 (0.044)		
M03_12	M052417	0.037	—	0.947 (0.041)	0.225 (0.032)			
M03_13	M052501	0.026	—	0.866 (0.042)	0.892 (0.043)			
M03_14	M052410	0.033	—	0.904 (0.096)	0.574 (0.085)	0.281 (0.029)		
M03_15	M052170	0.016	—	1.115 (0.130)	1.116 (0.064)	0.271 (0.019)		
M05_01	M042183	0.038	—	0.703 (0.062)	-0.152 (0.123)	0.163 (0.045)		
M05_02	M042060	0.025	—	1.318 (0.093)	-0.006 (0.050)	0.179 (0.024)		
M05_03	M042019	0.046	—	0.796 (0.037)	0.379 (0.038)			
M05_04	M042023	0.024	—	1.260 (0.053)	0.379 (0.027)			
M05_05	M042197	0.030	—	0.993 (0.047)	0.869 (0.039)			
M05_06	M042234	0.020	—	1.323 (0.093)	0.196 (0.045)	0.157 (0.020)		
M05_07	M042066	0.039	—	0.693 (0.034)	0.133 (0.040)			
M05_08	M042243	0.021	—	1.804 (0.114)	0.277 (0.029)	0.103 (0.013)		
M05_09	M042248	0.023	—	1.434 (0.062)	0.607 (0.026)			
M05_10Z	M042229Z	0.016	—	1.295 (0.044)	0.592 (0.019)		-0.119 (0.033)	0.119 (0.037)
M05_11A	M042080A	0.068	—	0.772 (0.037)	0.437 (0.040)			
M05_11B	M042080B	0.034	—	1.286 (0.068)	1.274 (0.041)			
M05_12	M042120	0.035	—	1.012 (0.087)	-0.090 (0.087)	0.266 (0.035)		
M05_13	M042203	0.025	—	1.404 (0.093)	0.005 (0.043)	0.140 (0.021)		
M05_14	M042264	0.025	—	0.795 (0.043)	1.192 (0.056)			
M05_15	M042255	0.055	—	0.661 (0.053)	-0.443 (0.127)	0.128 (0.047)		
M05_16	M042224	0.056	—	0.921 (0.040)	-0.185 (0.033)			
M06_01	M052017	0.028	—	1.167 (0.086)	0.006 (0.059)	0.185 (0.027)		
M06_02	M052217	0.019	—	1.371 (0.060)	0.667 (0.027)			
M06_03	M052021	0.019	—	1.035 (0.033)	0.566 (0.021)		-0.305 (0.041)	0.305 (0.045)
M06_04	M052095	0.016	—	1.606 (0.067)	0.390 (0.023)			
M06_05	M052094	0.019	—	1.188 (0.058)	1.067 (0.037)			
M06_06	M052131	0.013	—	1.130 (0.107)	0.730 (0.057)	0.233 (0.020)		
M06_07	M052090	0.019	—	1.161 (0.110)	0.776 (0.055)	0.213 (0.020)		
M06_08A	M052121A	0.029	—	0.994 (0.070)	0.197 (0.055)	0.100 (0.023)		
M06_08B	M052121B	0.022	—	1.810 (0.107)	1.439 (0.036)			
M06_09	M052042	0.020	—	0.873 (0.040)	0.460 (0.036)			
M06_10	M052047	0.024	—	1.126 (0.048)	0.248 (0.028)			
M06_11	M052044	0.024	—	1.581 (0.201)	1.115 (0.056)	0.391 (0.016)		
M06_12A	M052422A	0.034	—	0.754 (0.073)	-0.292 (0.146)	0.258 (0.052)		
M06_12B	M052422B	0.034	—	0.691 (0.060)	0.117 (0.104)	0.127 (0.038)		
M06_13	M052505	0.050	—	1.232 (0.096)	-0.860 (0.091)	0.262 (0.049)		

Item		RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
		2015	2019					
M07_01	M042015	0.048	—	0.863 (0.065)	-0.598 (0.107)	0.167 (0.048)		
M07_02	M042196	0.029	—	1.090 (0.069)	-0.042 (0.051)	0.088 (0.023)		
M07_03	M042194	0.039	—	1.195 (0.050)	-0.519 (0.029)			
M07_04A	M042114A	0.027	—	1.522 (0.062)	-0.108 (0.023)			
M07_04B	M042114B	0.035	—	1.553 (0.064)	0.169 (0.022)			
M07_05	M042112	0.043	—	0.871 (0.119)	1.140 (0.088)	0.313 (0.024)		
M07_06	M042109	0.016	—	1.527 (0.142)	0.968 (0.043)	0.214 (0.015)		
M07_07	M042050	0.015	—	1.074 (0.048)	0.628 (0.032)			
M07_08A	M042074A	0.037	—	1.019 (0.045)	0.487 (0.032)			
M07_08B	M042074B	0.037	—	0.954 (0.044)	0.662 (0.036)			
M07_08C	M042074C	0.023	—	1.690 (0.080)	0.922 (0.026)			
M07_09	M042151	0.032	—	0.818 (0.037)	-0.040 (0.035)			
M07_10	M042132	0.021	—	1.867 (0.185)	1.136 (0.038)	0.204 (0.012)		
M07_11	M042257	0.025	—	0.731 (0.071)	0.789 (0.077)	0.114 (0.026)		
M07_12	M042158	0.028	—	0.723 (0.081)	0.117 (0.144)	0.295 (0.046)		
M07_13	M042252	0.023	—	1.126 (0.099)	0.730 (0.053)	0.182 (0.020)		
M07_14	M042261	0.031	—	0.728 (0.060)	-0.140 (0.109)	0.139 (0.042)		

Items Common in 2015 and 2019:

MP01_01	MP52024	0.027	0.024	1.646 (0.082)	0.441 (0.026)	0.232 (0.012)		
MP01_02A	MP52058A	0.043	0.045	1.281 (0.035)	-0.364 (0.017)			
MP01_02B	MP52058B	0.014	0.015	1.504 (0.043)	0.882 (0.018)			
MP01_03	MP52125	0.022	0.024	1.196 (0.054)	0.575 (0.027)	0.098 (0.011)		
MP01_04	MP52229	0.039	0.033	0.887 (0.025)	0.000 (0.021)			
MP01_05	MP52063	0.035	0.028	1.320 (0.068)	0.562 (0.030)	0.196 (0.013)		
MP01_06	MP52072	0.041	0.030	1.009 (0.049)	-0.003 (0.046)	0.146 (0.021)		
MP01_07A	MP52146A	0.042	0.030	0.859 (0.025)	0.182 (0.022)			
MP01_07B	MP52146B	0.021	0.021	1.533 (0.048)	1.153 (0.020)			
MP01_08	MP52092	0.022	0.026	1.244 (0.090)	1.514 (0.037)	0.151 (0.008)		
MP01_09	MP52046	0.023	0.025	1.125 (0.086)	1.477 (0.041)	0.188 (0.010)		
MP01_10	MP52083	0.018	0.018	1.501 (0.080)	0.882 (0.025)	0.169 (0.010)		
MP01_11	MP52082	0.034	0.030	1.202 (0.057)	0.161 (0.036)	0.174 (0.017)		
MP01_12	MP52161	0.042	0.033	1.187 (0.056)	-0.210 (0.044)	0.189 (0.022)		
MP01_13A	MP52418A	0.034	0.032	1.908 (0.089)	0.649 (0.020)	0.147 (0.009)		
MP01_13B	MP52418B	0.021	0.014	1.916 (0.100)	0.554 (0.023)	0.250 (0.011)		
MP03_01	MP62005	0.025	0.023	0.871 (0.061)	0.478 (0.064)	0.304 (0.022)		
MP03_02	MP62139	0.020	0.019	0.986 (0.028)	0.583 (0.021)			
MP03_03	MP62164	0.028	0.022	1.357 (0.061)	0.075 (0.031)	0.172 (0.015)		
MP03_04	MP62142	0.034	0.033	0.916 (0.026)	-0.261 (0.021)			
MP03_05	MP62084	0.017	0.022	1.393 (0.102)	1.553 (0.035)	0.144 (0.007)		
MP03_06	MP62351	0.022	0.027	0.804 (0.071)	1.405 (0.056)	0.207 (0.015)		
MP03_07	MP62223	0.031	0.034	1.420 (0.064)	-0.163 (0.033)	0.188 (0.018)		

Item	RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
	2015	2019					
MP03_08	MP62027	0.027	0.021	0.772 (0.024)	0.556 (0.026)		
MP03_09	MP62174	0.020	0.018	1.403 (0.092)	0.862 (0.034)	0.319 (0.012)	
MP03_10	MP62244	0.019	0.028	0.971 (0.028)	0.462 (0.021)		
MP03_11	MP62261	0.020	0.026	1.889 (0.128)	1.460 (0.025)	0.132 (0.006)	
MP03_12	MP62300	0.029	0.029	0.752 (0.015)	0.412 (0.016)	-0.488 (0.033)	0.488 (0.035)
MP03_13	MP62254	0.024	0.028	0.744 (0.028)	1.490 (0.044)		
MP03_14A	MP62132A	0.037	0.045	1.185 (0.033)	-0.296 (0.018)		
MP03_14B	MP62132B	0.027	0.021	1.049 (0.070)	0.777 (0.044)	0.263 (0.016)	
MP05_01	MP52413	0.034	0.033	1.063 (0.060)	0.027 (0.054)	0.286 (0.023)	
MP05_02	MP52134	0.037	0.036	1.261 (0.053)	-0.270 (0.036)	0.130 (0.019)	
MP05_03	MP52078	0.026	0.026	0.990 (0.061)	0.884 (0.040)	0.183 (0.014)	
MP05_04	MP52034	0.020	0.033	1.216 (0.071)	0.549 (0.038)	0.279 (0.015)	
MP05_05A	MP52174A	0.032	0.032	1.088 (0.030)	0.213 (0.018)		
MP05_05B	MP52174B	0.024	0.019	1.118 (0.034)	1.021 (0.023)		
MP05_06	MP52130	0.019	0.015	1.232 (0.071)	0.970 (0.031)	0.173 (0.011)	
MP05_07	MP52073	0.021	0.018	1.385 (0.066)	0.473 (0.028)	0.174 (0.012)	
MP05_08	MP52110	0.019	0.020	1.464 (0.040)	0.653 (0.016)		
MP05_09	MP52105	0.025	0.026	1.172 (0.040)	1.428 (0.029)		
MP05_10	MP52407	0.012	0.020	1.344 (0.082)	0.359 (0.042)	0.378 (0.016)	
MP05_11	MP52036	0.034	0.029	0.730 (0.023)	0.439 (0.026)		
MP05_12	MP52502	0.045	0.042	1.165 (0.032)	-0.249 (0.018)		
MP05_13	MP52117	0.027	0.035	0.625 (0.028)	2.096 (0.075)		
MP05_14	MP52426	0.069	0.061	0.785 (0.040)	-0.797 (0.092)	0.142 (0.042)	
MP06_01	MP62150	0.039	0.044	1.111 (0.030)	-0.303 (0.019)		
MP06_02	MP62335	0.041	0.032	1.377 (0.061)	-0.106 (0.033)	0.175 (0.017)	
MP06_03	MP62219	0.019	0.020	2.050 (0.112)	0.851 (0.021)	0.218 (0.009)	
MP06_04	MP62002	0.027	0.032	0.703 (0.023)	0.620 (0.028)		
MP06_05	MP62149	0.031	0.032	1.089 (0.052)	0.507 (0.032)	0.111 (0.013)	
MP06_06	MP62241	0.024	0.017	1.708 (0.047)	0.633 (0.014)		
MP06_08	MP62105	0.026	0.027	0.757 (0.015)	0.850 (0.017)	-1.718 (0.062)	1.718 (0.064)
MP06_09	MP62040	0.027	0.023	0.769 (0.061)	0.947 (0.060)	0.224 (0.020)	
MP06_10	MP62288	0.024	0.022	0.776 (0.017)	1.140 (0.020)	-0.880 (0.041)	0.880 (0.047)
MP06_11	MP62173	0.025	0.027	1.119 (0.033)	0.812 (0.021)		
MP06_12	MP62133	0.014	0.019	1.315 (0.071)	0.616 (0.031)	0.214 (0.013)	
MP06_13A	MP62123A	0.021	0.027	1.562 (0.085)	0.354 (0.032)	0.306 (0.014)	
MP06_13B	MP62123B	0.020	0.025	1.444 (0.070)	0.704 (0.025)	0.138 (0.010)	
MP07_01	MP52079	0.026	0.028	0.966 (0.060)	0.424 (0.052)	0.271 (0.020)	
MP07_02	MP52204	0.031	0.026	0.871 (0.051)	0.396 (0.052)	0.180 (0.020)	
MP07_03	MP52364	0.045	0.050	1.177 (0.031)	-0.093 (0.017)		
MP07_04	MP52215	0.043	0.043	0.878 (0.025)	-0.248 (0.022)		
MP07_05	MP52147	0.016	0.020	1.572 (0.091)	0.762 (0.028)	0.275 (0.011)	

Item	RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
	2015	2019					
MP07_06	MP52067	0.032	0.033	1.063 (0.059)	0.067 (0.051)	0.263 (0.021)	
MP07_07	MP52068	0.016	0.015	1.417 (0.085)	1.264 (0.028)	0.132 (0.008)	
MP07_08	MP52087	0.022	0.028	1.622 (0.051)	1.139 (0.019)		
MP07_09	MP52048	0.021	0.024	1.019 (0.032)	1.148 (0.027)		
MP07_10	MP52039	0.018	0.018	1.235 (0.033)	0.272 (0.017)		
MP07_11	MP52208	0.018	0.018	2.264 (0.113)	1.111 (0.017)	0.081 (0.005)	
MP07_12A	MP52419A	0.048	0.048	0.888 (0.034)	-0.373 (0.042)	0.050 (0.018)	
MP07_12B	MP52419B	0.054	0.048	1.372 (0.055)	-0.672 (0.036)	0.104 (0.022)	
MP07_13	MP52115	0.031	0.021	1.738 (0.068)	0.348 (0.018)	0.080 (0.008)	
MP07_14	MP52421	0.038	0.031	0.824 (0.025)	0.641 (0.025)		
MP09_01	MP62329	0.069	0.074	0.793 (0.043)	-0.836 (0.103)	0.184 (0.046)	
MP09_02	MP62151	0.019	0.025	1.247 (0.035)	0.717 (0.019)		
MP09_03	MP62346	0.024	0.038	1.185 (0.033)	0.646 (0.019)		
MP09_04	MP62212	0.015	0.019	1.397 (0.077)	1.090 (0.026)	0.124 (0.008)	
MP09_05	MP62056	0.021	0.018	1.244 (0.039)	1.127 (0.023)		
MP09_06	MP62317	0.017	0.021	1.328 (0.038)	0.823 (0.018)		
MP09_07	MP62350	0.016	0.019	1.389 (0.099)	1.538 (0.034)	0.129 (0.007)	
MP09_08	MP62078	0.029	0.031	1.441 (0.040)	0.612 (0.016)		
MP09_09	MP62284	0.042	0.052	0.676 (0.056)	0.412 (0.100)	0.290 (0.031)	
MP09_10	MP62245	0.019	0.024	1.273 (0.069)	0.642 (0.031)	0.204 (0.013)	
MP09_11	MP62287	0.022	0.029	1.283 (0.044)	1.390 (0.027)		
MP09_12A	MP62345A	0.047	0.045	0.589 (0.016)	0.447 (0.021)	0.267 (0.034)	-0.267 (0.038)
MP09_13	MP62115	0.024	0.018	1.507 (0.108)	1.358 (0.031)	0.202 (0.009)	
MP11_01	MP62271	0.040	0.031	1.536 (0.081)	0.526 (0.029)	0.252 (0.012)	
MP11_02	MP62152	0.014	0.025	1.197 (0.032)	0.348 (0.017)		
MP11_03	MP62215	0.023	0.027	0.889 (0.019)	0.655 (0.015)	-0.188 (0.027)	0.188 (0.030)
MP11_04	MP62143	0.023	0.020	1.655 (0.047)	0.804 (0.016)		
MP11_05	MP62230	0.020	0.024	1.555 (0.112)	1.358 (0.031)	0.224 (0.008)	
MP11_06	MP62095	0.014	0.013	1.586 (0.080)	0.550 (0.026)	0.219 (0.011)	
MP11_07	MP62076	0.017	0.022	1.745 (0.089)	0.231 (0.028)	0.291 (0.014)	
MP11_08	MP62030	0.054	0.054	0.536 (0.020)	0.058 (0.032)		
MP11_09	MP62171	0.048	0.041	0.832 (0.042)	-0.145 (0.062)	0.128 (0.027)	
MP11_10	MP62301	0.018	0.024	1.080 (0.032)	0.998 (0.024)		
MP11_11	MP62194	0.049	0.039	1.025 (0.058)	-0.273 (0.066)	0.290 (0.028)	
MP11_12	MP62344	0.032	0.033	0.874 (0.028)	1.092 (0.030)		
MP11_13	MP62320	0.020	0.018	1.899 (0.077)	0.470 (0.018)	0.092 (0.008)	
MP11_14	MP62296	0.029	0.043	1.222 (0.033)	0.049 (0.017)		
MP13_01	MP62001	0.020	0.021	1.007 (0.077)	0.847 (0.050)	0.339 (0.016)	
MP13_02	MP62214	0.024	0.020	1.151 (0.031)	0.389 (0.018)		
MP13_03	MP62146	0.023	0.018	1.444 (0.068)	0.705 (0.023)	0.124 (0.010)	
MP13_04	MP62154	0.028	0.034	1.359 (0.036)	-0.086 (0.016)		

Item	RMSD		Slope (a _i)	Location (b _i)	Guessing (c _i)	Step 1 (d _{i1})	Step 2 (d _{i2})
	2015	2019					
MP13_05	MP62067	0.037	0.038	1.159 (0.068)	0.096 (0.051)	0.335 (0.020)	
MP13_06	MP62341	0.027	0.035	0.932 (0.088)	1.643 (0.057)	0.218 (0.012)	
MP13_07	MP62242	0.032	0.024	1.269 (0.059)	0.175 (0.033)	0.171 (0.016)	
MP13_08A	MP62250A	0.025	0.024	1.207 (0.032)	0.138 (0.017)		
MP13_08B	MP62250B	0.021	0.025	1.403 (0.040)	0.817 (0.018)		
MP13_09	MP62170	0.087	0.083	0.535 (0.016)	0.921 (0.027)	0.551 (0.035)	-0.551 (0.046)
MP13_10	MP62192	0.017	0.021	1.044 (0.033)	1.120 (0.026)		
MP13_11	MP62072	0.046	0.045	1.024 (0.028)	0.110 (0.019)		
MP13_13	MP62120	0.029	0.022	1.250 (0.062)	0.465 (0.031)	0.166 (0.013)	

Items Introduced in 2019:

MP02_01	MP72007	—	0.032	0.528 (0.034)	1.023 (0.082)		-0.407 (0.102)	0.407 (0.137)
MP02_02	MP72025	—	0.023	1.492 (0.214)	0.629 (0.067)	0.195 (0.024)		
MP02_03	MP72017	—	0.024	1.319 (0.106)	1.017 (0.065)			
MP02_04	MP72190	—	0.048	0.740 (0.057)	-0.038 (0.059)			
MP02_05	MP72068	—	0.044	1.285 (0.156)	-0.020 (0.080)	0.185 (0.038)		
MP02_06	MP72076	—	0.036	0.859 (0.127)	0.550 (0.100)	0.092 (0.038)		
MP02_07	MP72056	—	0.028	1.159 (0.082)	0.551 (0.053)			
MP02_08	MP72098	—	0.022	1.597 (0.122)	0.813 (0.049)			
MP02_09	MP72103	—	0.019	1.249 (0.176)	0.645 (0.073)	0.150 (0.026)		
MP02_10	MP72121	—	0.049	1.309 (0.084)	-0.264 (0.037)			
MP02_11	MP72180	—	0.027	0.671 (0.057)	0.634 (0.086)			
MP02_12	MP72198	—	0.024	1.233 (0.089)	0.610 (0.052)			
MP02_13	MP72227	—	0.028	1.507 (0.107)	0.578 (0.045)			
MP02_14	MP72170	—	0.033	0.875 (0.064)	0.071 (0.054)			
MP02_15	MP72209	—	0.018	1.057 (0.097)	1.360 (0.099)			
MP04_01	MP72178	—	0.025	0.933 (0.076)	1.032 (0.082)			
MP04_02	MP72234	—	0.028	0.959 (0.195)	0.942 (0.118)	0.258 (0.034)		
MP04_03	MP72020	—	0.040	0.639 (0.035)	-0.020 (0.042)		-0.266 (0.082)	0.266 (0.087)
MP04_04	MP72027	—	0.025	1.225 (0.150)	0.211 (0.074)	0.154 (0.033)		
MP04_05	MP72052	—	0.036	0.814 (0.080)	1.554 (0.133)			
MP04_06	MP72067	—	0.028	1.318 (0.164)	-0.004 (0.081)	0.218 (0.038)		
MP04_07A	MP72083A	—	0.049	1.406 (0.090)	-0.091 (0.036)			
MP04_07B	MP72083B	—	0.033	0.776 (0.116)	0.469 (0.113)	0.076 (0.044)		
MP04_08A	MP72108A	—	0.049	0.728 (0.056)	-0.011 (0.060)			
MP04_08B	MP72108B	—	0.031	1.025 (0.074)	0.513 (0.056)			
MP04_09	MP72181	—	0.024	1.211 (0.087)	0.634 (0.053)			
MP04_10	MP72126	—	0.041	0.679 (0.037)	0.900 (0.058)		-0.811 (0.102)	0.811 (0.123)
MP04_11	MP72164	—	0.020	0.858 (0.071)	0.981 (0.086)			
MP04_12A	MP72185A	—	0.025	1.612 (0.112)	0.447 (0.039)			
MP04_12B	MP72185B	—	0.027	1.506 (0.105)	0.429 (0.041)			

Item	RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
	2015	2019					
MP08_01	MP72002	—	0.026	1.517 (0.106)	0.542 (0.042)		
MP08_02	MP72188	—	0.022	1.280 (0.183)	0.770 (0.071)	0.138 (0.023)	
MP08_03	MP72035	—	0.023	1.132 (0.081)	0.551 (0.053)		
MP08_04	MP72055	—	0.023	1.391 (0.102)	0.707 (0.050)		
MP08_05	MP72222	—	0.047	0.603 (0.125)	0.651 (0.177)	0.098 (0.065)	
MP08_06	MP72090	—	0.025	1.211 (0.203)	0.877 (0.085)	0.198 (0.026)	
MP08_07	MP72233	—	0.022	1.075 (0.220)	0.692 (0.119)	0.367 (0.035)	
MP08_08A	MP72106A	—	0.047	1.068 (0.071)	-0.298 (0.043)		
MP08_08B	MP72106B	—	0.024	1.376 (0.097)	0.569 (0.046)		
MP08_08C	MP72106C	—	0.032	1.344 (0.104)	0.887 (0.058)		
MP08_09A	MP72128A	—	0.027	0.999 (0.073)	0.544 (0.058)		
MP08_09B	MP72128B	—	0.042	0.892 (0.058)	1.035 (0.058)	0.042 (0.065)	-0.042 (0.098)
MP08_10	MP72119	—	0.043	0.826 (0.063)	0.425 (0.064)		
MP08_11A	MP72153A	—	0.036	1.021 (0.072)	0.378 (0.053)		
MP08_11B	MP72153B	—	0.018	1.548 (0.140)	1.231 (0.068)		
MP08_12	MP72172	—	0.033	1.048 (0.116)	0.094 (0.075)	0.060 (0.033)	
MP10_01	MP72187	—	0.070	0.770 (0.057)	-0.336 (0.055)		
MP10_02	MP72022	—	0.020	1.631 (0.322)	1.070 (0.083)	0.279 (0.021)	
MP10_04	MP72045	—	0.025	1.307 (0.089)	0.461 (0.046)		
MP10_05	MP72049	—	0.039	0.986 (0.068)	0.059 (0.048)		
MP10_06	MP72069	—	0.052	1.335 (0.085)	-0.062 (0.038)		
MP10_07	MP72074	—	0.027	1.162 (0.090)	0.926 (0.066)		
MP10_08	MP72013	—	0.031	1.126 (0.152)	0.594 (0.075)	0.120 (0.027)	
MP10_09	MP72095	—	0.034	1.416 (0.098)	0.514 (0.045)		
MP10_10	MP72109	—	0.021	1.467 (0.122)	1.084 (0.062)		
MP10_11	MP72125	—	0.026	2.017 (0.268)	0.820 (0.050)	0.107 (0.015)	
MP10_12	MP72196	—	0.032	1.376 (0.096)	0.544 (0.046)		
MP10_13	MP72237	—	0.054	0.963 (0.136)	-0.045 (0.125)	0.194 (0.054)	
MP10_14	MP72232	—	0.049	0.787 (0.059)	-0.072 (0.056)		
MP10_15	MP72206	—	0.024	1.330 (0.120)	1.289 (0.079)		
MP12_01	MP72001	—	0.021	1.523 (0.109)	0.611 (0.046)		
MP12_02	MP72019	—	0.030	1.726 (0.118)	0.391 (0.037)		
MP12_03	MP72189	—	0.051	0.993 (0.162)	0.246 (0.120)	0.262 (0.046)	
MP12_04	MP72024	—	0.044	0.899 (0.069)	0.616 (0.068)		
MP12_05	MP72043	—	0.022	2.286 (0.337)	0.759 (0.050)	0.171 (0.016)	
MP12_06	MP72221	—	0.041	1.207 (0.173)	0.331 (0.084)	0.219 (0.034)	
MP12_07	MP72220	—	0.023	1.330 (0.259)	1.153 (0.097)	0.202 (0.021)	
MP12_08	MP72225	—	0.027	1.263 (0.088)	0.450 (0.048)		
MP12_09A	MP72110A	—	0.025	1.493 (0.107)	0.586 (0.046)		
MP12_09B	MP72110B	—	0.018	1.649 (0.130)	0.873 (0.051)		
MP12_10	MP72150	—	0.019	1.827 (0.346)	0.413 (0.083)	0.481 (0.027)	

Item	RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
	2015	2019					
MP12_11	MP72139	—	0.019	1.155 (0.093)	0.995 (0.072)		
MP12_12	MP72229	—	0.013	0.966 (0.067)	1.433 (0.069)	-1.025 (0.143)	1.025 (0.170)
MP12_13	MP72171	—	0.026	1.437 (0.099)	0.405 (0.043)		
MP12_14A	MP72211A	—	0.022	1.497 (0.213)	0.472 (0.068)	0.220 (0.027)	
MP14_01	MP72005	—	0.039	0.704 (0.113)	0.125 (0.169)	0.100 (0.068)	
MP14_02	MP72021	—	0.036	0.916 (0.065)	0.241 (0.054)		
MP14_03	MP72026	—	0.057	0.651 (0.055)	0.615 (0.085)		
MP14_04A	MP72041A	—	0.024	1.268 (0.083)	0.104 (0.040)		
MP14_04B	MP72041B	—	0.035	1.471 (0.098)	0.364 (0.040)		
MP14_05	MP72223	—	0.019	1.948 (0.294)	0.663 (0.058)	0.250 (0.021)	
MP14_06	MP72094	—	0.053	1.172 (0.077)	-0.033 (0.041)		
MP14_07	MP72059	—	0.024	1.363 (0.096)	0.616 (0.048)		
MP14_08	MP72080	—	0.016	1.587 (0.217)	0.874 (0.061)	0.118 (0.017)	
MP14_09	MP72081	—	0.028	0.961 (0.075)	0.861 (0.072)		
MP14_10	MP72140	—	0.031	0.837 (0.062)	0.344 (0.060)		
MP14_11	MP72120	—	0.022	1.146 (0.085)	0.779 (0.060)		
MP14_12	MP72131	—	0.018	1.349 (0.119)	1.286 (0.076)		
MP14_13	MP72147	—	0.013	1.697 (0.149)	1.172 (0.060)		
MP14_14	MP72154	—	0.034	1.325 (0.164)	0.106 (0.075)	0.189 (0.035)	
MP14_15	MP72192	—	0.032	1.009 (0.157)	0.444 (0.104)	0.209 (0.040)	
MP14_16	MP72161	—	0.035	1.164 (0.084)	0.618 (0.054)		

Appendix 12D: Science Item Parameters from the paperTIMSS 2019 Concurrent Calibration—Grade 8

Item		RMSD		Slope (a _i)	Location (b _i)	Guessing (c _i)	Step 1 (d _{i1})	Step 2 (d _{i2})
		2015	2019					
Items Released in 2015:								
S01_01	S042258	0.018	—	0.791 (0.098)	1.025 (0.078)	0.186 (0.026)		
S01_02	S042005	0.024	—	0.353 (0.012)	0.568 (0.043)		-2.479 (0.126)	2.479 (0.131)
S01_03	S042016	0.019	—	1.022 (0.115)	1.220 (0.060)	0.135 (0.017)		
S01_04A	S042300A	0.030	—	1.349 (0.056)	0.064 (0.024)			
S01_04B	S042300B	0.056	—	0.549 (0.042)	1.743 (0.116)			
S01_04C	S042300C	0.026	—	1.132 (0.049)	0.132 (0.027)			
S01_05	S042319	0.022	—	1.345 (0.063)	0.762 (0.028)			
S01_06	S042068	0.020	—	1.305 (0.142)	1.022 (0.049)	0.220 (0.017)		
S01_07	S042216	0.026	—	1.045 (0.110)	0.414 (0.078)	0.338 (0.029)		
S01_08	S042249	0.024	—	0.771 (0.076)	0.474 (0.083)	0.163 (0.032)		
S01_09	S042094	0.024	—	0.832 (0.044)	0.761 (0.041)			
S01_10A	S042293A	0.040	—	0.917 (0.042)	-0.393 (0.035)			
S01_10B	S042293B	0.015	—	0.905 (0.065)	1.813 (0.092)			
S01_11	S042195	0.015	—	0.617 (0.047)	1.856 (0.118)			
S01_12	S042400	0.019	—	1.017 (0.053)	0.976 (0.040)			
S01_14	S042164	0.023	—	1.015 (0.087)	0.503 (0.056)	0.154 (0.024)		
S02_01	S062189	0.034	—	0.450 (0.022)	0.004 (0.038)		0.311 (0.069)	-0.311 (0.068)
S02_02	S062094	0.023	—	0.981 (0.087)	0.444 (0.063)	0.188 (0.026)		
S02_03	S062118	0.050	—	0.886 (0.041)	-0.004 (0.032)			
S02_04A	S062103A	0.022	—	1.125 (0.109)	0.562 (0.060)	0.265 (0.024)		
S02_04B	S062103B	0.027	—	0.723 (0.033)	1.006 (0.036)		0.218 (0.043)	-0.218 (0.060)
S02_05	S062010	0.028	—	0.513 (0.034)	0.830 (0.065)			
S02_06	S062253	0.024	—	0.876 (0.083)	0.852 (0.058)	0.115 (0.021)		
S02_07	S062051	0.023	—	0.905 (0.046)	0.776 (0.038)			
S02_08	S062044	0.019	—	1.091 (0.124)	1.326 (0.061)	0.121 (0.015)		
S02_09	S062046	0.032	—	0.896 (0.042)	0.166 (0.032)			
S02_10	S062149	0.029	—	0.442 (0.032)	0.908 (0.078)			
S02_11	S062268	0.035	—	0.997 (0.080)	-0.354 (0.091)	0.253 (0.039)		
S02_12	S062170	0.030	—	0.697 (0.088)	0.247 (0.146)	0.336 (0.044)		
S02_13	S062234	0.050	—	0.811 (0.033)	0.605 (0.027)		0.677 (0.037)	-0.677 (0.047)
S02_14	S062271	0.018	—	0.743 (0.110)	1.028 (0.101)	0.284 (0.031)		
S03_01	S052261	0.021	—	0.936 (0.096)	0.705 (0.066)	0.214 (0.025)		
S03_02Z	S052092Z	0.068	—	0.364 (0.019)	0.733 (0.054)		0.998 (0.077)	-0.998 (0.095)
S03_03A	S052263A	0.031	—	1.419 (0.077)	1.222 (0.037)			
S03_03B	S052263B	0.029	—	1.637 (0.080)	0.972 (0.027)			
S03_04	S052265	0.039	—	0.787 (0.043)	0.904 (0.047)			
S03_05	S052280	0.026	—	0.994 (0.095)	0.418 (0.071)	0.259 (0.028)		

Item		RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
		2015	2019					
S03_06	S052256	0.024	—	1.175 (0.104)	0.694 (0.048)	0.185 (0.020)		
S03_07Z	S052043Z	0.024	—	0.531 (0.035)	1.089 (0.074)			
S03_08	S052194	0.023	—	1.174 (0.113)	0.771 (0.051)	0.218 (0.021)		
S03_09	S052179	0.018	—	0.931 (0.114)	1.060 (0.069)	0.225 (0.023)		
S03_10	S052233	0.022	—	0.711 (0.048)	1.601 (0.086)			
S03_11	S052159	0.035	—	0.483 (0.077)	0.299 (0.255)	0.321 (0.061)		
S03_12A	S052289A	0.066	—	0.840 (0.067)	-0.998 (0.134)	0.226 (0.055)		
S03_12B	S052289B	0.027	—	0.658 (0.081)	0.848 (0.098)	0.174 (0.033)		
S03_12C	S052289C	0.035	—	0.847 (0.044)	0.729 (0.040)			
S05_01	S042053	0.026	—	1.216 (0.092)	-0.167 (0.064)	0.243 (0.030)		
S05_02	S042408	0.019	—	0.740 (0.040)	0.630 (0.042)			
S05_03	S042015	0.024	—	0.902 (0.094)	0.629 (0.072)	0.223 (0.027)		
S05_04	S042309	0.041	—	0.369 (0.062)	1.045 (0.231)	0.166 (0.054)		
S05_05A	S042049A	0.050	—	1.048 (0.047)	-0.596 (0.035)			
S05_05B	S042049B	0.033	—	1.187 (0.052)	0.220 (0.026)			
S05_06	S042182	0.043	—	0.660 (0.060)	-0.466 (0.144)	0.186 (0.050)		
S05_07	S042402	0.017	—	0.909 (0.051)	1.126 (0.050)			
S05_08A	S042228A	0.018	—	1.465 (0.077)	1.100 (0.033)			
S05_08B	S042228B	0.023	—	1.336 (0.057)	0.012 (0.024)			
S05_08C	S042228C	0.022	—	1.542 (0.068)	0.504 (0.022)			
S05_09	S042126	0.020	—	0.806 (0.099)	0.214 (0.129)	0.402 (0.039)		
S05_10	S042210	0.021	—	0.985 (0.185)	1.587 (0.112)	0.312 (0.020)		
S05_11	S042176	0.023	—	1.069 (0.051)	0.650 (0.032)			
S05_12	S042211	0.022	—	0.885 (0.042)	0.110 (0.032)			
S05_13	S042135	0.030	—	0.791 (0.039)	-0.238 (0.038)			
S05_14	S042257	0.016	—	0.543 (0.106)	1.313 (0.164)	0.304 (0.040)		
S06_01	S052003	0.022	—	0.911 (0.100)	0.122 (0.108)	0.393 (0.036)		
S06_02	S052071	0.018	—	1.310 (0.102)	0.469 (0.043)	0.172 (0.020)		
S06_03	S052246	0.019	—	0.909 (0.103)	0.850 (0.070)	0.227 (0.025)		
S06_04	S052276	0.032	—	0.739 (0.070)	-0.025 (0.112)	0.212 (0.040)		
S06_05A	S052303A	0.030	—	0.631 (0.070)	0.012 (0.150)	0.239 (0.048)		
S06_05B	S052303B	0.021	—	0.795 (0.041)	0.611 (0.039)			
S06_06	S052125	0.028	—	0.751 (0.125)	0.913 (0.123)	0.422 (0.032)		
S06_07	S052145	0.022	—	1.201 (0.053)	0.389 (0.026)			
S06_08	S052049	0.037	—	0.690 (0.032)	0.861 (0.034)		0.456 (0.043)	-0.456 (0.059)
S06_09	S052063	0.027	—	0.639 (0.074)	0.524 (0.112)	0.189 (0.038)		
S06_10	S052192	0.020	—	1.421 (0.088)	0.206 (0.035)	0.098 (0.017)		
S06_11	S052232	0.020	—	0.472 (0.093)	1.664 (0.178)	0.200 (0.039)		
S06_12	S052141	0.016	—	1.278 (0.062)	0.876 (0.031)			
S06_13	S052096	0.025	—	0.948 (0.084)	-0.089 (0.091)	0.277 (0.036)		
S06_14	S052116	0.029	—	0.870 (0.033)	0.205 (0.022)		0.172 (0.039)	-0.172 (0.039)

Item		RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
		2015	2019					
S06_15	S052110	0.019	—	0.861 (0.049)	1.084 (0.050)			
S07_01	S042042	0.046	—	0.638 (0.070)	-0.431 (0.192)	0.304 (0.058)		
S07_02	S042030	0.016	—	0.864 (0.049)	1.098 (0.050)			
S07_03	S042003	0.021	—	0.685 (0.108)	1.079 (0.112)	0.287 (0.033)		
S07_04	S042110	0.052	—	0.596 (0.054)	-0.549 (0.157)	0.160 (0.052)		
S07_05A	S042222A	0.018	—	0.961 (0.055)	1.238 (0.052)			
S07_05B	S042222B	0.017	—	0.957 (0.049)	0.842 (0.038)			
S07_05C	S042222C	0.030	—	0.823 (0.074)	-0.133 (0.105)	0.235 (0.040)		
S07_06	S042065	0.050	—	0.724 (0.072)	-0.925 (0.194)	0.335 (0.064)		
S07_07	S042280	0.022	—	1.268 (0.090)	0.202 (0.046)	0.155 (0.022)		
S07_08	S042088	0.030	—	0.666 (0.035)	0.108 (0.041)			
S07_09	S042218	0.016	—	1.339 (0.114)	0.453 (0.049)	0.246 (0.022)		
S07_10	S042104	0.025	—	0.862 (0.048)	1.065 (0.049)			
S07_11	S042064	0.024	—	0.765 (0.041)	0.712 (0.043)			
S07_12	S042273	0.024	—	1.171 (0.051)	0.243 (0.026)			
S07_13	S042301	0.027	—	0.820 (0.040)	0.102 (0.034)			
S07_14	S042312	0.045	—	0.372 (0.050)	-0.414 (0.352)	0.219 (0.077)		
S07_15	S042217	0.022	—	1.769 (0.158)	0.717 (0.036)	0.246 (0.016)		
S07_16	S042406	0.018	—	1.060 (0.052)	0.710 (0.033)			

Items Common in 2015 and 2019:

SP01_01	SP52006	0.048	0.050	0.635 (0.017)	-0.098 (0.019)		0.620 (0.034)	-0.620 (0.030)
SP01_02	SP52069	0.023	0.029	0.984 (0.072)	0.601 (0.051)	0.325 (0.018)		
SP01_03	SP52012	0.020	0.026	0.947 (0.051)	0.342 (0.042)	0.163 (0.018)		
SP01_04	SP52021	0.019	0.028	1.029 (0.031)	0.638 (0.020)			
SP01_05Z	SP52095Z	0.040	0.038	0.505 (0.020)	-0.198 (0.035)			
SP01_06	SP52134	0.024	0.033	2.121 (0.201)	1.373 (0.029)	0.296 (0.009)		
SP01_07	SP52054	0.047	0.038	0.749 (0.024)	-0.380 (0.027)			
SP01_08	SP52150	0.020	0.030	0.787 (0.067)	1.170 (0.051)	0.181 (0.017)		
SP01_09A	SP52243A	0.028	0.029	0.624 (0.022)	0.373 (0.028)			
SP01_09B	SP52243B	0.032	0.025	0.769 (0.025)	0.394 (0.024)			
SP01_09C	SP52243C	0.029	0.027	0.671 (0.061)	1.026 (0.065)	0.200 (0.022)		
SP01_10	SP52206	0.022	0.022	1.127 (0.063)	0.478 (0.036)	0.207 (0.016)		
SP01_11A	SP52112A	0.031	0.037	0.672 (0.046)	-0.042 (0.095)	0.221 (0.033)		
SP01_11B	SP52112B	0.026	0.028	0.992 (0.031)	0.764 (0.022)			
SP01_12	SP52294	0.034	0.026	1.085 (0.054)	-0.084 (0.045)	0.206 (0.021)		
SP03_01	SP62055	0.040	0.032	0.962 (0.067)	-0.088 (0.079)	0.438 (0.026)		
SP03_02	SP62007	0.022	0.022	1.176 (0.064)	0.457 (0.034)	0.205 (0.015)		
SP03_03	SP62275	0.046	0.023	0.888 (0.029)	0.786 (0.024)			
SP03_04	SP62225	0.022	0.022	1.004 (0.098)	1.334 (0.050)	0.259 (0.014)		
SP03_05	SP62111	0.033	0.034	0.587 (0.016)	0.516 (0.020)		0.033 (0.034)	-0.033 (0.038)
SP03_06A	SP62116A	0.027	0.025	1.164 (0.034)	0.529 (0.017)			

Item	RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
	2015	2019					
SP03_06B	SP62116B	0.019	0.029	1.319 (0.041)	0.859 (0.018)		
SP03_06C	SP62116C	0.021	0.027	0.946 (0.035)	1.247 (0.033)		
SP03_07	SP62262	0.017	0.023	0.891 (0.080)	1.063 (0.051)	0.277 (0.017)	
SP03_08	SP62035	0.023	0.022	1.076 (0.077)	1.029 (0.036)	0.199 (0.013)	
SP03_09	SP62144	0.061	0.062	0.725 (0.040)	-0.600 (0.090)	0.163 (0.035)	
SP03_10	SP62162	0.023	0.025	0.777 (0.027)	0.813 (0.028)		
SP03_11	SP62233	0.021	0.015	0.927 (0.077)	0.753 (0.055)	0.343 (0.019)	
SP03_13	SP62171	0.039	0.031	0.384 (0.048)	0.825 (0.188)	0.185 (0.047)	
SP05_01	SP52076	0.030	0.034	0.934 (0.059)	0.343 (0.052)	0.257 (0.021)	
SP05_02	SP52272	0.037	0.044	1.130 (0.031)	-0.074 (0.018)		
SP05_03A	SP52085A	0.020	0.024	1.038 (0.036)	1.164 (0.028)		
SP05_03B	SP52085B	0.045	0.045	1.034 (0.029)	-0.059 (0.019)		
SP05_04	SP52094	0.026	0.028	0.614 (0.024)	0.963 (0.038)		
SP05_05	SP52248	0.021	0.021	1.188 (0.148)	1.547 (0.061)	0.364 (0.012)	
SP05_06	SP52146	0.031	0.026	1.023 (0.030)	0.343 (0.019)		
SP05_07	SP52282	0.028	0.028	0.828 (0.059)	0.790 (0.048)	0.185 (0.018)	
SP05_08	SP52299	0.027	0.025	1.224 (0.072)	0.325 (0.041)	0.309 (0.017)	
SP05_09	SP52144	0.016	0.026	1.160 (0.072)	0.642 (0.036)	0.249 (0.015)	
SP05_10	SP52214	0.032	0.028	0.996 (0.029)	0.288 (0.019)		
SP05_12	SP52101	0.037	0.026	0.563 (0.023)	0.975 (0.041)		
SP05_13	SP52113	0.027	0.020	1.565 (0.089)	0.529 (0.029)	0.292 (0.013)	
SP05_14	SP52107	0.022	0.021	1.000 (0.084)	1.260 (0.043)	0.197 (0.013)	
SP06_01	SP62090	0.038	0.038	1.011 (0.061)	0.112 (0.055)	0.304 (0.022)	
SP06_02	SP62274	0.050	0.050	0.577 (0.015)	0.811 (0.024)		1.149 (0.032) -1.149 (0.044)
SP06_03	SP62284	0.047	0.052	0.375 (0.042)	0.410 (0.211)	0.172 (0.050)	
SP06_04A	SP62098A	0.036	0.035	0.639 (0.016)	0.432 (0.018)		-0.050 (0.033) 0.050 (0.035)
SP06_04B	SP62098B	0.016	0.023	0.798 (0.023)	1.269 (0.024)		-0.091 (0.029) 0.091 (0.041)
SP06_05	SP62032	0.042	0.037	1.742 (0.171)	1.436 (0.036)	0.287 (0.009)	
SP06_06	SP62043	0.033	0.016	0.907 (0.031)	0.914 (0.026)		
SP06_07	SP62158	0.034	0.032	0.697 (0.062)	0.610 (0.082)	0.299 (0.026)	
SP06_08	SP62159	0.035	0.027	0.983 (0.056)	0.333 (0.044)	0.204 (0.019)	
SP06_09	SP62005	0.026	0.032	1.250 (0.036)	0.598 (0.017)		
SP06_10	SP62075	0.019	0.030	0.990 (0.074)	0.702 (0.049)	0.314 (0.018)	
SP06_11	SP62004	0.022	0.025	1.806 (0.095)	0.817 (0.020)	0.173 (0.009)	
SP06_12	SP62175	0.054	0.043	0.739 (0.025)	0.607 (0.026)		
SP06_13A	SP62173A	0.032	0.035	0.702 (0.024)	0.266 (0.025)		
SP06_13B	SP62173B	0.020	0.020	0.808 (0.100)	1.794 (0.086)	0.203 (0.014)	
SP07_01A	SP52090A	0.042	0.036	0.494 (0.062)	0.472 (0.186)	0.393 (0.041)	
SP07_01B	SP52090B	0.041	0.022	0.609 (0.030)	1.894 (0.075)		
SP07_02	SP52262	0.030	0.026	0.694 (0.060)	0.843 (0.066)	0.227 (0.023)	
SP07_03	SP52267	0.024	0.029	0.988 (0.064)	0.695 (0.041)	0.216 (0.016)	

Item	RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
	2015	2019					
SP07_04	SP52273	0.035	0.035	0.638 (0.018)	0.866 (0.022)	0.174 (0.031)	-0.174 (0.039)
SP07_05Z	SP52015Z	0.043	0.043	0.830 (0.025)	-0.301 (0.024)		
SP07_06	SP52051	0.028	0.026	1.005 (0.032)	0.748 (0.021)		
SP07_07	SP52026	0.048	0.048	0.587 (0.059)	0.400 (0.129)	0.350 (0.034)	
SP07_08	SP52130	0.020	0.026	0.909 (0.075)	1.134 (0.045)	0.215 (0.015)	
SP07_09	SP52028	0.030	0.027	0.858 (0.063)	0.552 (0.058)	0.282 (0.021)	
SP07_10	SP52189	0.028	0.045	1.041 (0.030)	0.382 (0.018)		
SP07_11	SP52217	0.025	0.022	0.722 (0.070)	0.991 (0.068)	0.283 (0.022)	
SP07_12	SP52038	0.020	0.019	0.994 (0.079)	0.909 (0.045)	0.290 (0.016)	
SP07_13	SP52099	0.032	0.026	0.947 (0.031)	0.817 (0.023)		
SP07_14	SP52118	0.017	0.025	0.766 (0.030)	1.225 (0.038)		
SP09_01	SP62099	0.031	0.028	0.842 (0.047)	0.256 (0.050)	0.146 (0.021)	
SP09_02	SP62095	0.024	0.030	0.501 (0.015)	0.683 (0.024)	-0.076 (0.039)	0.076 (0.046)
SP09_03	SP62106	0.056	0.055	0.750 (0.037)	-0.721 (0.078)	0.116 (0.032)	
SP09_04	SP62064	0.048	0.033	0.879 (0.026)	-0.356 (0.023)		
SP09_05	SP62132	0.021	0.029	0.992 (0.063)	0.332 (0.052)	0.289 (0.020)	
SP09_06	SP62163	0.016	0.026	1.196 (0.043)	1.308 (0.028)		
SP09_07	SP62153	0.015	0.025	1.278 (0.089)	0.853 (0.035)	0.294 (0.013)	
SP09_08	SP62018	0.028	0.032	0.520 (0.015)	1.485 (0.038)	-0.653 (0.046)	0.653 (0.061)
SP09_09	SP62143	0.025	0.017	0.850 (0.037)	1.704 (0.052)		
SP09_10	SP62276	0.030	0.027	0.718 (0.027)	0.995 (0.034)		
SP09_11	SP62050	0.039	0.022	0.920 (0.031)	1.006 (0.027)		
SP09_12	SP62205	0.024	0.023	1.100 (0.066)	0.825 (0.032)	0.158 (0.013)	
SP09_13	SP62190	0.035	0.031	0.883 (0.045)	0.023 (0.051)	0.140 (0.022)	
SP09_14A	SP62024A	0.027	0.023	0.605 (0.059)	0.876 (0.085)	0.226 (0.028)	
SP09_14B	SP62024B	0.018	0.020	0.801 (0.032)	1.446 (0.044)		
SP11_01	SP62279	0.046	0.049	1.185 (0.055)	0.007 (0.037)	0.187 (0.017)	
SP11_02	SP62112	0.058	0.039	0.534 (0.020)	0.216 (0.032)		
SP11_03	SP62119	0.028	0.025	1.214 (0.063)	0.158 (0.038)	0.249 (0.017)	
SP11_04	SP62093	0.048	0.036	0.630 (0.017)	0.063 (0.018)	0.306 (0.033)	-0.306 (0.032)
SP11_05	SP62089	0.015	0.030	1.347 (0.078)	0.934 (0.026)	0.153 (0.010)	
SP11_06	SP62006	0.033	0.036	0.953 (0.028)	0.362 (0.020)		
SP11_07	SP62067	0.036	0.026	0.823 (0.026)	0.365 (0.022)		
SP11_08	SP62247	0.030	0.030	0.977 (0.090)	1.232 (0.048)	0.268 (0.014)	
SP11_09	SP62177	0.021	0.019	0.711 (0.062)	1.008 (0.060)	0.207 (0.020)	
SP11_10	SP62186	0.023	0.026	1.545 (0.119)	1.177 (0.030)	0.263 (0.010)	
SP11_11A	SP62211A	0.024	0.026	0.814 (0.026)	0.346 (0.022)		
SP11_11B	SP62211B	0.017	0.020	0.868 (0.045)	2.081 (0.075)		
SP11_13	SP62033	0.035	0.021	1.106 (0.034)	0.694 (0.019)		
SP11_14	SP62037	0.027	0.028	0.747 (0.062)	0.564 (0.074)	0.305 (0.024)	
SP11_15	SP62242	0.080	0.072	0.786 (0.026)	-1.200 (0.038)		

Item	RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
	2015	2019					
SP13_01A	SP62091A	0.034	0.042	0.958 (0.053)	-0.706 (0.081)	0.304 (0.035)	
SP13_01B	SP62091B	0.054	0.051	0.587 (0.035)	-1.185 (0.152)	0.167 (0.054)	
SP13_02	SP62100	0.024	0.024	0.898 (0.027)	0.336 (0.021)		
SP13_03	SP62097	0.021	0.029	0.909 (0.049)	0.266 (0.046)	0.147 (0.020)	
SP13_04	SP62101	0.027	0.026	0.668 (0.018)	0.179 (0.017)	0.287 (0.031)	-0.287 (0.031)
SP13_06	SP62128	0.027	0.028	0.867 (0.026)	-0.024 (0.021)		
SP13_07	SP62047	0.048	0.058	0.497 (0.021)	0.592 (0.037)		
SP13_08	SP62042	0.027	0.024	0.710 (0.025)	0.639 (0.028)		
SP13_09	SP62250	0.051	0.033	0.580 (0.024)	1.200 (0.047)		
SP13_10	SP62246	0.020	0.022	0.924 (0.088)	1.189 (0.051)	0.288 (0.016)	
SP13_11	SP62056	0.022	0.027	1.147 (0.033)	0.428 (0.017)		
SP13_12	SP62235	0.027	0.023	0.765 (0.060)	0.854 (0.056)	0.195 (0.020)	
SP13_13	SP62180	0.019	0.023	1.210 (0.062)	0.259 (0.036)	0.211 (0.017)	
SP13_14	SP62022	0.025	0.029	0.562 (0.022)	0.621 (0.034)		
SP13_15	SP62243	0.027	0.031	0.664 (0.015)	-0.015 (0.017)	-0.331 (0.036)	0.331 (0.034)

Items Introduced in 2019:

SP02_01	SP72072	—	0.031	0.824 (0.145)	0.518 (0.125)	0.216 (0.046)	
SP02_02	SP72029	—	0.030	1.324 (0.310)	1.057 (0.102)	0.364 (0.027)	
SP02_03	SP72902	—	0.048	1.017 (0.071)	0.145 (0.046)		
SP02_04	SP72077	—	0.032	0.685 (0.150)	0.395 (0.203)	0.300 (0.064)	
SP02_05A	SP72900A	—	0.037	0.959 (0.079)	0.884 (0.069)		
SP02_05B	SP72900B	—	0.022	0.954 (0.093)	1.360 (0.104)		
SP02_06	SP72103	—	0.048	0.500 (0.049)	-0.078 (0.084)		
SP02_07	SP72110	—	0.026	0.773 (0.069)	0.982 (0.089)		
SP02_08	SP72130	—	0.029	0.559 (0.057)	0.992 (0.118)		
SP02_09	SP72148	—	0.030	0.679 (0.153)	1.158 (0.145)	0.132 (0.042)	
SP02_10	SP72200	—	0.029	0.854 (0.129)	0.672 (0.092)	0.103 (0.034)	
SP02_11	SP72232	—	0.042	1.433 (0.096)	0.257 (0.036)		
SP02_12	SP72275	—	0.057	1.016 (0.108)	-0.521 (0.106)	0.117 (0.050)	
SP02_13	SP72244	—	0.030	0.950 (0.072)	0.497 (0.055)		
SP02_14	SP72301	—	0.020	0.936 (0.217)	1.199 (0.127)	0.220 (0.032)	
SP02_15	SP72721	—	0.033	1.028 (0.130)	0.253 (0.084)	0.137 (0.036)	
SP02_16	SP72335	—	0.029	0.859 (0.147)	0.552 (0.115)	0.199 (0.043)	
SP04_01	SP72002	—	0.031	1.393 (0.172)	0.239 (0.068)	0.212 (0.031)	
SP04_03	SP72021	—	0.035	0.896 (0.140)	0.336 (0.115)	0.221 (0.044)	
SP04_04	SP72082	—	0.057	0.960 (0.069)	0.291 (0.050)		
SP04_05	SP72066	—	0.032	0.837 (0.128)	0.591 (0.099)	0.123 (0.037)	
SP04_06	SP72063	—	0.026	0.582 (0.246)	1.996 (0.389)	0.200 (0.047)	
SP04_07	SP72102	—	0.043	0.482 (0.049)	0.544 (0.102)		
SP04_08A	SP72141A	—	0.024	1.069 (0.086)	0.876 (0.063)		
SP04_08B	SP72141B	—	0.032	0.731 (0.045)	0.601 (0.047)	-0.141 (0.075)	0.141 (0.090)

Item	RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
	2015	2019					
SP04_09	SP72921	—	0.021	0.766 (0.077)	1.371 (0.122)		
SP04_10	SP72234	—	0.029	1.141 (0.277)	1.472 (0.139)	0.167 (0.022)	
SP04_11	SP72251	—	0.020	1.064 (0.189)	0.855 (0.090)	0.208 (0.030)	
SP04_12	SP72284	—	0.046	0.786 (0.058)	-0.058 (0.055)		
SP04_13	SP72345	—	0.048	0.860 (0.054)	0.372 (0.040)	0.552 (0.056)	-0.552 (0.068)
SP04_14	SP72349	—	0.037	1.086 (0.134)	0.083 (0.089)	0.178 (0.039)	
SP04_15	SP72363	—	0.049	0.613 (0.102)	0.073 (0.188)	0.101 (0.067)	
SP08_01	SP72070	—	0.057	0.568 (0.111)	-0.261 (0.322)	0.207 (0.099)	
SP08_02	SP72400	—	0.038	0.859 (0.061)	-0.012 (0.051)		
SP08_03	SP72024	—	0.046	0.891 (0.105)	-0.094 (0.107)	0.113 (0.045)	
SP08_04	SP72462	—	0.036	0.490 (0.138)	0.724 (0.286)	0.198 (0.086)	
SP08_05	SP72443	—	0.024	1.165 (0.254)	0.983 (0.103)	0.334 (0.030)	
SP08_06	SP72903	—	0.039	0.796 (0.048)	0.754 (0.046)	-0.090 (0.067)	0.090 (0.084)
SP08_07	SP72145	—	0.018	0.949 (0.091)	1.373 (0.102)		
SP08_08	SP72100	—	0.039	0.560 (0.132)	0.579 (0.227)	0.195 (0.073)	
SP08_10	SP72137	—	0.037	0.836 (0.132)	0.367 (0.122)	0.194 (0.046)	
SP08_11	SP72298	—	0.033	0.814 (0.064)	0.558 (0.063)		
SP08_12	SP72215	—	0.023	0.515 (0.033)	0.963 (0.072)	-0.538 (0.104)	0.538 (0.130)
SP08_13	SP72260	—	0.032	0.671 (0.056)	0.451 (0.071)		
SP08_14	SP72265	—	0.041	0.708 (0.057)	0.249 (0.063)		
SP08_15	SP72347	—	0.031	1.061 (0.208)	1.117 (0.099)	0.186 (0.028)	
SP08_16	SP72351	—	0.029	0.847 (0.072)	0.930 (0.077)		
SP08_17	SP72367	—	0.029	1.114 (0.159)	0.638 (0.076)	0.156 (0.030)	
SP10_01	SP72033	—	0.033	0.649 (0.035)	0.355 (0.044)	-0.436 (0.084)	0.436 (0.094)
SP10_02	SP72440	—	0.043	0.670 (0.053)	-0.347 (0.063)		
SP10_03	SP72032	—	0.029	1.540 (0.315)	1.001 (0.083)	0.315 (0.024)	
SP10_04	SP72031	—	0.025	0.655 (0.139)	0.941 (0.143)	0.137 (0.047)	
SP10_05	SP72086	—	0.038	0.556 (0.049)	-0.161 (0.073)		
SP10_06	SP72005	—	0.038	1.030 (0.065)	0.729 (0.040)	0.248 (0.050)	-0.248 (0.070)
SP10_08	SP72123	—	0.033	0.551 (0.125)	-0.003 (0.329)	0.249 (0.095)	
SP10_09	SP72116	—	0.026	0.574 (0.180)	1.172 (0.213)	0.198 (0.060)	
SP10_10	SP72920	—	0.060	0.599 (0.036)	0.920 (0.061)	1.334 (0.071)	-1.334 (0.128)
SP10_11	SP72294	—	0.033	0.914 (0.066)	0.207 (0.051)		
SP10_12	SP72231	—	0.029	1.257 (0.239)	0.923 (0.088)	0.265 (0.027)	
SP10_13	SP72261	—	0.043	0.671 (0.053)	-0.379 (0.064)		
SP10_14	SP72220	—	0.041	1.761 (0.627)	1.732 (0.166)	0.210 (0.017)	
SP10_15	SP72348	—	0.074	0.805 (0.059)	-0.844 (0.065)		
SP10_16	SP72720	—	0.030	0.412 (0.179)	1.745 (0.333)	0.135 (0.090)	
SP12_01	SP72078	—	0.029	1.019 (0.074)	0.458 (0.052)		
SP12_02	SP72460	—	0.022	0.962 (0.178)	0.710 (0.107)	0.254 (0.036)	
SP12_03	SP72000	—	0.030	0.717 (0.042)	0.318 (0.042)	-0.024 (0.070)	0.024 (0.080)

Item	RMSD		Slope (a_i)	Location (b_i)	Guessing (c_i)	Step 1 (d_{i1})	Step 2 (d_{i2})
	2015	2019					
SP12_05	SP72901	—	0.022	0.612 (0.185)	1.121 (0.202)	0.273 (0.057)	
SP12_06	SP72038	—	0.039	0.487 (0.108)	0.297 (0.277)	0.103 (0.089)	
SP12_07	SP72120	—	0.043	0.441 (0.104)	-0.046 (0.410)	0.092 (0.121)	
SP12_08	SP72143	—	0.036	0.731 (0.058)	0.314 (0.064)		
SP12_09	SP72523	—	0.049	0.663 (0.043)	0.319 (0.047)	0.309 (0.071)	-0.309 (0.084)
SP12_10	SP72168	—	0.032	1.195 (0.152)	0.319 (0.075)	0.176 (0.031)	
SP12_11	SP72205	—	0.025	1.159 (0.214)	0.881 (0.090)	0.244 (0.029)	
SP12_12	SP72293	—	0.029	0.959 (0.078)	0.858 (0.069)		
SP12_13A	SP72280A	—	0.027	1.309 (0.098)	0.755 (0.050)		
SP12_13B	SP72280B	—	0.029	1.433 (0.202)	-0.062 (0.095)	0.387 (0.039)	
SP12_14	SP72370	—	0.023	1.461 (0.214)	0.419 (0.073)	0.289 (0.030)	
SP14_01	SP72011	—	0.031	1.602 (0.170)	0.059 (0.057)	0.165 (0.029)	
SP14_02	SP72905	—	0.053	0.687 (0.053)	-0.340 (0.062)		
SP14_03	SP72049	—	0.030	0.805 (0.162)	0.616 (0.139)	0.270 (0.047)	
SP14_04	SP72016	—	0.027	0.782 (0.045)	0.560 (0.042)	-0.167 (0.069)	0.167 (0.082)
SP14_05	SP72451	—	0.047	1.084 (0.072)	-0.162 (0.043)		
SP14_06	SP72074	—	0.033	0.785 (0.061)	0.344 (0.060)		
SP14_07	SP72091	—	0.025	1.170 (0.198)	0.763 (0.084)	0.233 (0.030)	
SP14_08	SP72109	—	0.036	0.551 (0.054)	0.836 (0.108)		
SP14_09	SP72140	—	0.024	0.906 (0.206)	0.981 (0.125)	0.279 (0.037)	
SP14_10	SP72132	—	0.018	0.853 (0.096)	1.693 (0.151)		
SP14_11	SP72209	—	0.024	1.207 (0.200)	0.640 (0.085)	0.268 (0.032)	
SP14_12	SP72210	—	0.064	0.484 (0.038)	1.244 (0.088)	0.992 (0.087)	-0.992 (0.154)
SP14_13	SP72249	—	0.022	1.008 (0.170)	0.929 (0.089)	0.143 (0.028)	
SP14_14	SP72323	—	0.028	0.697 (0.169)	0.723 (0.179)	0.295 (0.056)	
SP14_15	SP72368	—	0.024	1.197 (0.191)	0.488 (0.090)	0.286 (0.034)	
SP14_16	SP72303	—	0.021	1.205 (0.255)	1.065 (0.102)	0.210 (0.026)	