

TIMSS 2011

The TIMSS 2011 Students Like Learning Mathematics Scale, Eighth Grade

The Students Like Learning Mathematics (SLM) scale was created based on students' degree of agreement to the five statements described below. See [Creating and Interpreting TIMSS and PIRLS 2011 Context Questionnaire Scales](#) for more information on how the scales were formed.

Exhibit 1: Items in the TIMSS 2011 Students Like Learning Mathematics Scale, Eighth Grade

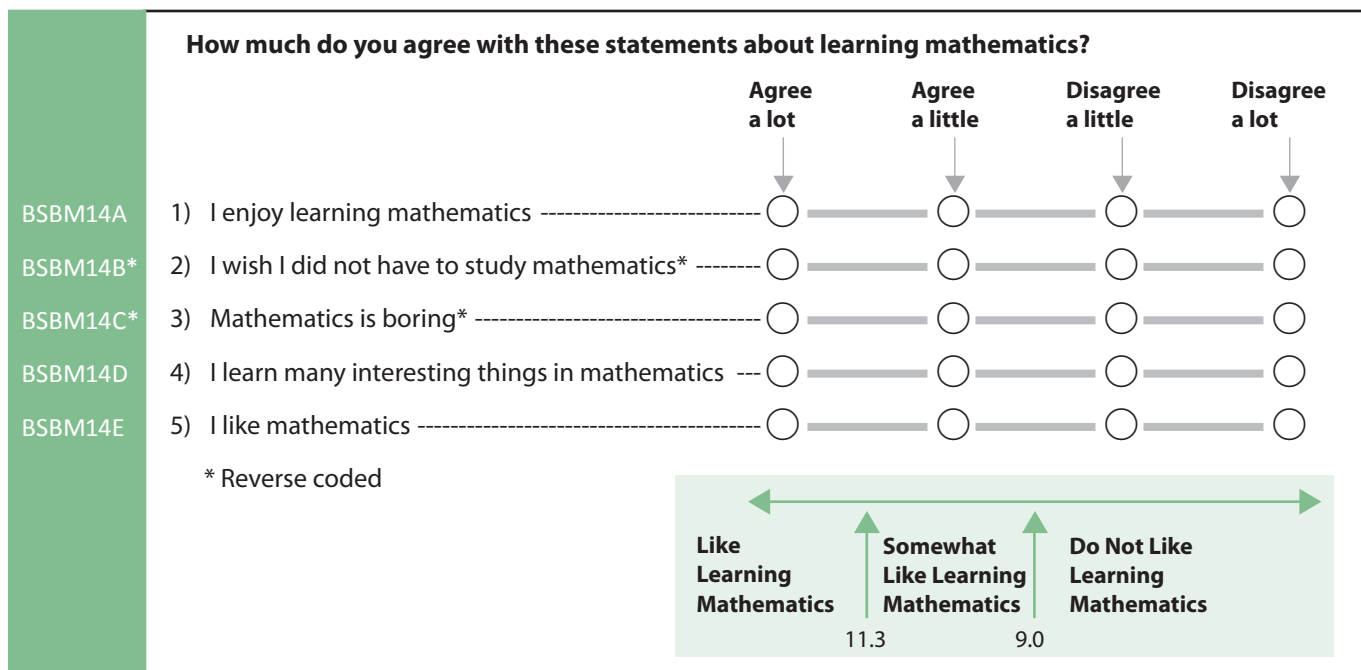


Exhibit 2: Item Parameters for the TIMSS 2011 Students Like Learning Mathematics Scale, Eighth Grade

Item	delta	tau_1	tau_2	tau_3
BSBM14A	-0.86003	-1.15709	-0.50102	1.65811
BSBM14B*	-0.75253	-1.06549	0.12032	0.94517
BSBM14C*	-0.44286	-1.41516	0.16990	1.24526
BSBM14D	-1.21535	-1.36983	-0.26388	1.63371
BSBM14E	-0.65793	-1.03493	-0.42036	1.45529

*Reverse coded

Exhibit 3: Scale Transformation Constants

Scale Transformation Constants

$$A = 10.05058$$

$$B = 1.14305$$

$$\text{Transformed Scale Score} = 10.05058 + 1.14305 \cdot \text{Logit Scale Score}$$

Exhibit 4: Equivalence Table of the Raw Score and the Transformed Scale Score

Raw Score	Transformed Scale Score	Cutpoint	Raw Score	Transformed Scale Score	Cutpoint
0	5.03748		8	9.26151	
1	6.36452		9	9.60334	
2	7.03246		10	9.96500	
3	7.51389		11	10.35777	
4	7.91187		12	10.80246	
5	8.26761		13	11.33851	11.3
6	8.60159		14	12.07123	
7	8.93041	9.0	15	13.46506	

Exhibit 5: Cronbach's Alpha Reliability Coefficient and Principal Components Analysis of the Items in the TIMSS 2011 Students Like Learning Mathematics Scale, Eighth Grade

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item				
			BSBM14A	BSBM14B*	BSBM14C*	BSBM14D	BSBM14E
Armenia	0.83	60	0.83	0.68	0.71	0.76	0.86
Australia	0.88	69	0.89	0.78	0.81	0.76	0.91
Bahrain	0.83	61	0.87	0.59	0.75	0.77	0.88
Chile	0.86	64	0.86	0.74	0.80	0.73	0.88
Chinese Taipei	0.92	76	0.91	0.81	0.86	0.86	0.92
England	0.88	68	0.88	0.78	0.78	0.77	0.89
Finland	0.91	74	0.89	0.82	0.85	0.83	0.91
Georgia	0.83	60	0.86	0.69	0.70	0.71	0.88
Ghana	0.61	42	0.76	0.52	0.46	0.67	0.78
Hong Kong SAR	0.89	70	0.88	0.75	0.80	0.82	0.91
Hungary	0.87	66	0.88	0.75	0.79	0.76	0.88
Indonesia	0.81	58	0.83	0.62	0.76	0.72	0.84
Iran, Islamic Rep. of	0.85	63	0.84	0.77	0.72	0.74	0.87
Israel	0.87	67	0.87	0.73	0.79	0.79	0.90
Italy	0.90	72	0.90	0.85	0.85	0.73	0.91
Japan	0.87	67	0.88	0.70	0.81	0.82	0.88
Jordan	0.78	55	0.83	0.54	0.70	0.73	0.87
Kazakhstan	0.80	56	0.81	0.64	0.67	0.75	0.86
Korea, Rep. of	0.90	72	0.89	0.75	0.85	0.85	0.91
Lebanon	0.78	54	0.80	0.66	0.65	0.72	0.85

Exhibit 5: Cronbach's Alpha Reliability Coefficient and Principal Components Analysis of the Items in the TIMSS 2011 Students Like Learning Mathematics Scale, Eighth Grade (Continued)

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item				
			BSBM14A	BSBM14B*	BSBM14C*	BSBM14D	BSBM14E
Lithuania	0.87	65	0.87	0.76	0.79	0.73	0.89
Macedonia, Rep. of	0.83	61	0.86	0.61	0.72	0.79	0.88
Malaysia	0.83	60	0.85	0.67	0.72	0.77	0.86
Morocco	0.74	51	0.81	0.51	0.70	0.66	0.84
New Zealand	0.88	69	0.89	0.76	0.80	0.77	0.91
Norway	0.90	71	0.89	0.79	0.83	0.80	0.91
Oman	0.75	53	0.81	0.52	0.69	0.73	0.85
Palestinian Nat'l Auth.	0.78	54	0.83	0.59	0.70	0.69	0.85
Qatar	0.83	60	0.86	0.60	0.76	0.76	0.88
Romania	0.84	62	0.83	0.68	0.77	0.75	0.88
Russian Federation	0.86	64	0.86	0.69	0.79	0.77	0.89
Saudi Arabia	0.85	62	0.85	0.72	0.77	0.71	0.88
Singapore	0.90	72	0.88	0.82	0.83	0.78	0.91
Slovenia	0.89	70	0.87	0.75	0.85	0.81	0.89
Sweden	0.89	70	0.88	0.76	0.85	0.79	0.90
Syrian Arab Republic	0.75	52	0.82	0.45	0.67	0.71	0.86
Thailand	0.81	57	0.80	0.69	0.76	0.69	0.84
Tunisia	0.83	61	0.85	0.62	0.79	0.73	0.88
Turkey	0.82	60	0.84	0.70	0.79	0.63	0.88
Ukraine	0.88	67	0.87	0.76	0.81	0.76	0.89
United Arab Emirates	0.85	63	0.86	0.67	0.77	0.75	0.88
United States	0.89	69	0.89	0.78	0.81	0.77	0.90
Ninth Grade Participants							
Botswana	0.78	55	0.80	0.66	0.74	0.64	0.84
Honduras	0.77	53	0.81	0.61	0.68	0.68	0.83
South Africa	0.77	53	0.81	0.65	0.70	0.65	0.83
Benchmarking Participants							
Alberta, Canada	0.89	69	0.89	0.79	0.81	0.75	0.90
Ontario, Canada	0.89	70	0.90	0.79	0.82	0.76	0.91
Quebec, Canada	0.88	68	0.88	0.77	0.82	0.75	0.89
Abu Dhabi, UAE	0.83	61	0.85	0.64	0.76	0.75	0.88
Dubai, UAE	0.86	65	0.87	0.73	0.79	0.76	0.89
Alabama, US	0.89	70	0.89	0.79	0.81	0.79	0.89
California, US	0.87	66	0.89	0.76	0.78	0.74	0.89
Colorado, US	0.90	71	0.89	0.79	0.82	0.79	0.90
Connecticut, US	0.89	70	0.89	0.77	0.83	0.78	0.89
Florida, US	0.88	68	0.89	0.78	0.80	0.74	0.90

Exhibit 5: Cronbach's Alpha Reliability Coefficient and Principal Components Analysis of the Items in the TIMSS 2011 Students Like Learning Mathematics Scale, Eighth Grade (Continued)

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item				
			BSBM14A	BSBM14B*	BSBM14C*	BSBM14D	BSBM14E
Benchmarking Participants							
Indiana, US	0.89	70	0.90	0.80	0.81	0.76	0.90
Massachusetts, US	0.89	70	0.90	0.80	0.80	0.78	0.90
Minnesota, US	0.89	71	0.89	0.80	0.81	0.78	0.91
North Carolina, US	0.89	70	0.89	0.78	0.81	0.77	0.91

*Reverse Coded

Exhibit 6: Relationship Between the TIMSS 2011 Students Like Learning Mathematics Scale, Eighth Grade, and TIMSS 2011 Mathematics Achievement

Country	Pearson's Correlation with Mathematics Achievement		Variance in Mathematics Achievement Accounted for by Difference Between Regions of the Scale (η^2)
	(r)	(r ²)	
Armenia	0.32	0.10	0.09
Australia	0.34	0.12	0.11
Bahrain	0.27	0.07	0.08
Chile	0.24	0.06	0.06
Chinese Taipei	0.45	0.20	0.18
England	0.30	0.09	0.07
Finland	0.39	0.15	0.12
Georgia	0.25	0.06	0.05
Ghana	0.35	0.12	0.11
Hong Kong SAR	0.38	0.15	0.13
Hungary	0.23	0.05	0.05
Indonesia	0.09	0.01	0.00
Iran, Islamic Rep. of	0.28	0.08	0.09
Israel	0.17	0.03	0.03
Italy	0.34	0.12	0.11
Japan	0.34	0.12	0.10
Jordan	0.29	0.08	0.09
Kazakhstan	0.18	0.03	0.03
Korea, Rep. of	0.43	0.18	0.17
Lebanon	0.25	0.06	0.07
Lithuania	0.25	0.06	0.05
Macedonia, Rep. of	0.11	0.01	0.02
Malaysia	0.23	0.05	0.04
Morocco	0.30	0.09	0.08
New Zealand	0.26	0.07	0.06
Norway	0.35	0.12	0.10
Oman	0.38	0.14	0.14
Palestinian Nat'l Auth.	0.29	0.08	0.08

Exhibit 6: Relationship Between the TIMSS 2011 Students Like Learning Mathematics Scale, Eighth Grade, and TIMSS 2011 Mathematics Achievement (Continued)

Country	Pearson's Correlation with Mathematics Achievement		Variance in Mathematics Achievement Accounted for by Difference Between Regions of the Scale (η^2)
	(r)	(r ²)	
Qatar	0.23	0.05	0.06
Romania	0.28	0.08	0.08
Russian Federation	0.27	0.07	0.07
Saudi Arabia	0.30	0.09	0.09
Singapore	0.27	0.07	0.07
Slovenia	0.25	0.06	0.05
Sweden	0.37	0.14	0.11
Syrian Arab Republic	0.23	0.05	0.05
Thailand	0.22	0.05	0.04
Tunisia	0.25	0.06	0.06
Turkey	0.30	0.09	0.10
Ukraine	0.23	0.05	0.05
United Arab Emirates	0.25	0.06	0.06
United States	0.23	0.05	0.04
International Median	0.27	0.07	0.07
Ninth Grade Participants			
Botswana	0.35	0.12	0.12
Honduras	0.14	0.02	0.03
South Africa	0.18	0.03	0.05
Benchmarking Participants			
Alberta, Canada	0.31	0.10	0.08
Ontario, Canada	0.37	0.14	0.12
Quebec, Canada	0.27	0.07	0.05
Abu Dhabi, UAE	0.29	0.08	0.09
Dubai, UAE	0.22	0.05	0.05
Alabama, US	0.10	0.01	0.01
California, US	0.18	0.03	0.03
Colorado, US	0.30	0.09	0.07
Connecticut, US	0.26	0.07	0.07
Florida, US	0.29	0.09	0.09
Indiana, US	0.23	0.05	0.05
Massachusetts, US	0.25	0.06	0.05
Minnesota, US	0.32	0.10	0.09
North Carolina, US	0.20	0.04	0.04