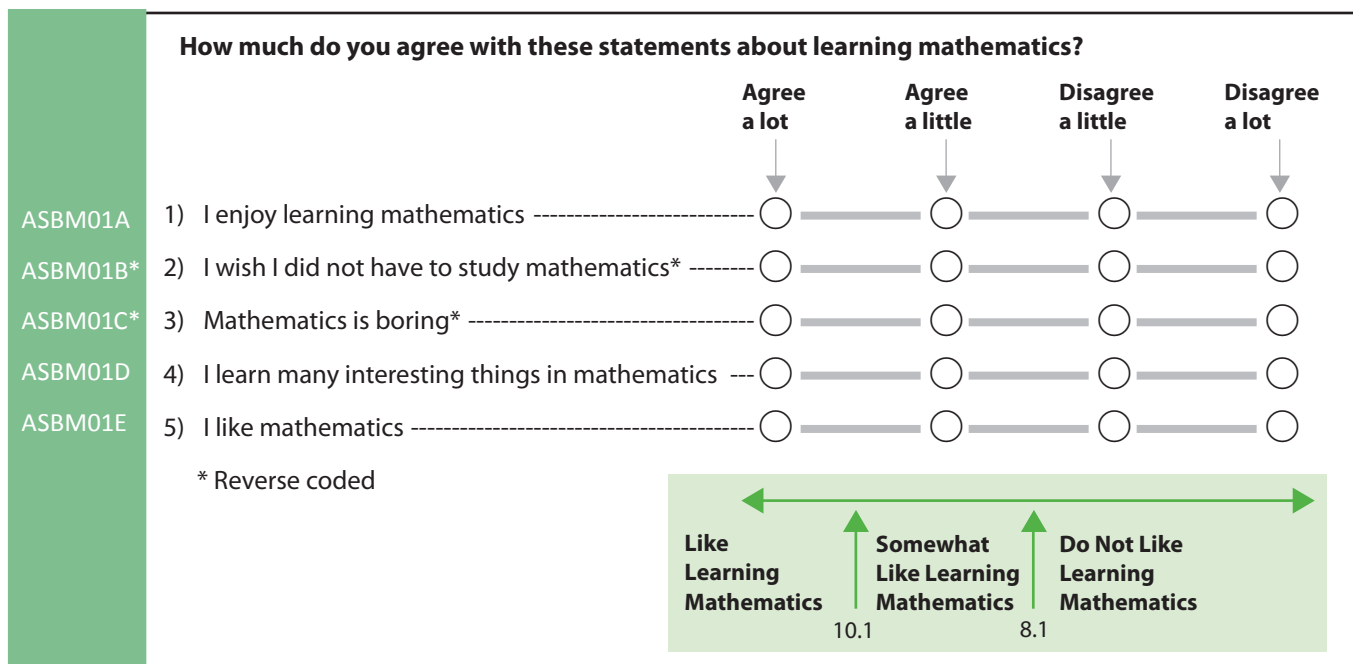


# TIMSS 2011

## The TIMSS 2011 Students Like Learning Mathematics Scale, Fourth Grade

The Students Like Learning Mathematics (SLM) scale was created based on students' degree of agreement with 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, Fourth Grade**



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

Item	delta	tau_1	tau_2	tau_3
ASBM01A	-1.79167	-0.52480	-0.49053	1.01533
ASBM01B*	-1.15393	-0.36521	0.03334	0.33187
ASBM01C*	-1.33408	-0.51769	0.08216	0.43553
ASBM01D	-2.07585	-0.55005	-0.29470	0.84475
ASBM01E	-1.63197	-0.34898	-0.36201	0.71099

\* Reverse coded

### Exhibit 3: Scale Transformation Constants

#### Scale Transformation Constants

$$A = 10.41262$$

$$B = 1.39969$$

$$\text{Transformed Scale Score} = 10.41262 + 1.39969 \cdot \text{Logit Scale Score}$$

### 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	4.21775		11	9.23526	
1	5.58135		12	9.61981	
2	6.23695		13	10.10488	10.1
3	6.70196		14	10.81939	
4	7.08013		15	12.35378	
5	7.41232				
6	7.71752				
7	8.01626				
8	8.30182				
9	8.59651				
10	8.90342	8.1			

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item				
			ASBM01A	ASBM01B*	ASBM01C*	ASBM01D	ASBM01E
Armenia	0.67	44	0.70	0.45	0.47	0.79	0.82
Australia	0.89	71	0.88	0.77	0.85	0.78	0.91
Austria	0.89	70	0.88	0.80	0.84	0.77	0.91
Azerbaijan	0.44	40	0.75	0.07	0.45	0.75	0.81
Bahrain	0.77	54	0.78	0.59	0.71	0.72	0.85
Belgium (Flemish)	0.90	72	0.91	0.84	0.88	0.67	0.92
Chile	0.83	60	0.84	0.68	0.79	0.69	0.87
Chinese Taipei	0.90	72	0.87	0.81	0.83	0.83	0.90
Croatia	0.90	73	0.89	0.79	0.85	0.81	0.91
Czech Republic	0.86	65	0.89	0.68	0.84	0.70	0.90
Denmark	0.88	69	0.88	0.76	0.81	0.81	0.90
England	0.87	67	0.88	0.75	0.81	0.74	0.90
Finland	0.92	75	0.88	0.81	0.89	0.83	0.92
Georgia	0.70	49	0.76	0.62	0.67	0.60	0.82
Germany	0.88	69	0.87	0.79	0.82	0.77	0.90
Hong Kong SAR	0.87	66	0.86	0.70	0.80	0.80	0.89
Hungary	0.86	66	0.87	0.74	0.79	0.74	0.90
Iran, Islamic Rep. of	0.77	54	0.78	0.70	0.69	0.68	0.82

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item				
			ASBM01A	ASBM01B*	ASBM01C*	ASBM01D	ASBM01E
Ireland	0.89	69	0.88	0.77	0.84	0.75	0.90
Italy	0.87	66	0.86	0.78	0.83	0.70	0.88
Japan	0.87	66	0.89	0.71	0.78	0.77	0.89
Kazakhstan	0.64	45	0.73	0.51	0.56	0.70	0.80
Korea, Rep. of	0.89	69	0.87	0.77	0.85	0.78	0.89
Kuwait	0.73	50	0.77	0.56	0.64	0.70	0.82
Lithuania	0.86	65	0.86	0.79	0.81	0.66	0.89
Malta	0.83	61	0.84	0.65	0.79	0.73	0.88
Morocco	0.59	40	0.65	0.56	0.57	0.62	0.73
Netherlands	0.87	66	0.88	0.78	0.84	0.63	0.90
New Zealand	0.88	68	0.88	0.78	0.81	0.74	0.90
Northern Ireland	0.88	69	0.88	0.76	0.85	0.75	0.89
Norway	0.89	70	0.88	0.73	0.87	0.78	0.91
Oman	0.64	45	0.72	0.48	0.60	0.71	0.79
Poland	0.86	65	0.87	0.73	0.82	0.70	0.90
Portugal	0.86	66	0.84	0.74	0.84	0.76	0.87
Qatar	0.73	50	0.72	0.58	0.66	0.74	0.81
Romania	0.80	58	0.82	0.65	0.76	0.69	0.86
Russian Federation	0.80	58	0.83	0.61	0.78	0.69	0.86
Saudi Arabia	0.74	51	0.74	0.63	0.68	0.68	0.81
Serbia	0.89	70	0.87	0.76	0.85	0.79	0.90
Singapore	0.90	71	0.87	0.81	0.85	0.79	0.90
Slovak Republic	0.85	64	0.87	0.71	0.82	0.67	0.90
Slovenia	0.87	67	0.86	0.71	0.82	0.80	0.90
Spain	0.83	61	0.83	0.65	0.80	0.72	0.88
Sweden	0.90	72	0.87	0.77	0.88	0.80	0.92
Thailand	0.74	51	0.75	0.63	0.72	0.66	0.79
Tunisia	0.69	47	0.71	0.62	0.68	0.65	0.77
Turkey	0.67	47	0.77	0.64	0.73	0.41	0.82
United Arab Emirates	0.76	54	0.78	0.60	0.70	0.73	0.84
United States	0.89	70	0.89	0.76	0.84	0.76	0.91
Yemen	0.57	40	0.73	0.38	0.30	0.74	0.82

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item				
			ASBM01A	ASBM01B*	ASBM01C*	ASBM01D	ASBM01E
<b>Sixth Grade Participants</b>							
Botswana	0.67	44	0.71	0.57	0.68	0.61	0.74
Honduras	0.67	46	0.77	0.51	0.60	0.64	0.81
Yemen	0.61	42	0.75	0.48	0.44	0.68	0.80
<b>Benchmarking Participants</b>							
Alberta, Canada	0.88	68	0.88	0.74	0.83	0.75	0.91
Ontario, Canada	0.88	68	0.89	0.75	0.83	0.73	0.90
Quebec, Canada	0.88	69	0.87	0.76	0.86	0.74	0.90
Abu Dhabi, UAE	0.73	51	0.75	0.53	0.68	0.73	0.84
Dubai, UAE	0.80	58	0.81	0.65	0.74	0.74	0.85
Florida, US	0.88	68	0.89	0.74	0.83	0.76	0.90
North Carolina, US	0.87	67	0.88	0.73	0.82	0.75	0.89

\* Reverse coded

**Exhibit 6: Relationship Between the TIMSS 2011 Students Like Learning Mathematics Scale, Fourth 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 ( $\eta^2$ )
	(r)	(r <sup>2</sup> )	
Armenia	0.27	0.07	0.06
Australia	0.20	0.04	0.04
Austria	0.13	0.02	0.02
Azerbaijan	0.21	0.04	0.02
Bahrain	0.22	0.05	0.07
Belgium (Flemish)	0.17	0.03	0.03
Chile	0.22	0.05	0.06
Chinese Taipei	0.22	0.05	0.05
Croatia	0.16	0.03	0.03
Czech Republic	0.14	0.02	0.02
Denmark	0.11	0.01	0.01
England	0.05	0.00	0.01
Finland	0.16	0.03	0.02
Georgia	0.29	0.09	0.08
Germany	0.13	0.02	0.02
Hong Kong SAR	0.23	0.05	0.06
Hungary	0.26	0.07	0.07

**Exhibit 6: Relationship Between the TIMSS 2011 Students Like Learning Mathematics Scale, Fourth 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 ( $\eta^2$ )
	(r)	(r <sup>2</sup> )	
Iran, Islamic Rep. of	0.23	0.05	0.06
Ireland	0.10	0.01	0.01
Italy	0.18	0.03	0.03
Japan	0.25	0.06	0.06
Kazakhstan	0.20	0.04	0.03
Korea, Rep. of	0.24	0.06	0.05
Kuwait	0.23	0.05	0.07
Lithuania	0.22	0.05	0.04
Malta	0.26	0.07	0.07
Morocco	0.32	0.10	0.09
Netherlands	0.15	0.02	0.02
New Zealand	0.05	0.00	0.00
Northern Ireland	0.14	0.02	0.02
Norway	0.11	0.01	0.02
Oman	0.37	0.14	0.12
Poland	0.19	0.04	0.04
Portugal	0.30	0.09	0.07
Qatar	0.29	0.08	0.10
Romania	0.29	0.08	0.08
Russian Federation	0.20	0.04	0.04
Saudi Arabia	0.25	0.06	0.07
Serbia	0.15	0.02	0.02
Singapore	0.25	0.06	0.06
Slovak Republic	0.22	0.05	0.04
Slovenia	0.14	0.02	0.02
Spain	0.21	0.04	0.05
Sweden	0.05	0.00	0.00
Thailand	0.27	0.07	0.08
Tunisia	0.32	0.10	0.10
Turkey	0.36	0.13	0.13
United Arab Emirates	0.24	0.06	0.07
United States	0.12	0.01	0.02
Yemen	0.30	0.09	0.08
<b>International Median</b>	<b>0.22</b>	<b>0.05</b>	<b>0.05</b>

**Exhibit 6: Relationship Between the TIMSS 2011 Students Like Learning Mathematics Scale, Fourth 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 ( $\eta^2$ )
	(r)	(r <sup>2</sup> )	
<b>Sixth Grade Participants</b>			
Botswana	0.38	0.15	0.15
Honduras	0.18	0.03	0.06
Yemen	0.28	0.08	0.08
<b>Benchmarking Participants</b>			
Alberta, Canada	0.18	0.03	0.03
Ontario, Canada	0.17	0.03	0.03
Quebec, Canada	0.23	0.05	0.05
Abu Dhabi, UAE	0.25	0.06	0.09
Dubai, UAE	0.21	0.04	0.05
Florida, US	0.12	0.02	0.02
North Carolina, US	0.11	0.01	0.01