

TIMSS 2011

The TIMSS 2011 Students Engaged in Mathematics Lessons Scale, Fourth Grade

The Students Engaged in Mathematics Lessons (EML) 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 Engaged in Mathematics Lessons Scale, Fourth Grade

How much do you agree with these statements about your mathematics lessons?

		Agree a lot	Agree a little	Disagree a little	Disagree a lot
ASBM02A	1) I know what my teacher expects me to do -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ASBM02B*	2) I think of things not related to the lesson*-----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ASBM02C	3) My teacher is easy to understand -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ASBM02D	4) I am interested in what my teacher says -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ASBM02E	5) My teacher gives me interesting things to do -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* Reverse coded

←-----→

Engaged Somewhat Engaged Not Engaged

10.2 7.4

Exhibit 2: Item Parameters for the TIMSS 2011 Students Engaged in Mathematics Lessons Scale, Fourth Grade

Item	delta	tau_1	tau_2	tau_3
ASBM02A	-1.21570	0.21936	-0.61370	0.39434
ASBM02B*	-0.44797	-0.34713	0.33771	0.00942
ASBM02C	-1.39952	-0.03401	-0.40727	0.44128
ASBM02D	-1.37500	-0.00969	-0.37823	0.38792
ASBM02E	-1.13337	-0.05836	-0.25623	0.31459

*Reverse coded

Exhibit 3: Scale Transformation Constants

Scale Transformation Constants

$$A = 10.08643$$

$$B = 2.14333$$

$$\text{Transformed Scale Score} = 10.08643 + 2.14333 \cdot \text{Logit Scale Score}$$

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	2.68358		8	7.76713	
1	4.40017		9	8.15972	
2	5.20671		10	8.58672	
3	5.77838		11	9.06562	
4	6.23645		12	9.61813	
5	6.63920		13	10.29349	10.2
6	7.01272		14	11.24211	
7	7.38785	7.4	15	13.26792	

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item				
			ASBM02A	ASBM02B*	ASBM02C	ASBM02D	ASBM02E
Armenia	0.57	47	0.38	0.11	0.82	0.88	0.86
Australia	0.70	50	0.61	0.39	0.75	0.85	0.83
Austria	0.68	47	0.63	0.38	0.71	0.82	0.80
Azerbaijan	0.27	35	0.44	-0.04	0.65	0.73	0.77
Bahrain	0.54	39	0.52	0.31	0.72	0.75	0.73
Belgium (Flemish)	0.61	42	0.61	0.37	0.69	0.77	0.74
Chile	0.53	39	0.55	0.27	0.67	0.76	0.74
Chinese Taipei	0.70	50	0.77	0.30	0.75	0.84	0.74
Croatia	0.61	43	0.52	0.37	0.68	0.80	0.79
Czech Republic	0.71	49	0.63	0.56	0.72	0.81	0.75
Denmark	0.65	43	0.45	0.50	0.68	0.80	0.78
England	0.68	47	0.60	0.44	0.70	0.82	0.79
Finland	0.71	49	0.58	0.43	0.74	0.84	0.82
Georgia	0.21	31	0.39	0.08	0.72	0.55	0.74
Germany	0.67	47	0.56	0.38	0.75	0.82	0.80
Hong Kong SAR	0.73	53	0.78	0.25	0.82	0.83	0.79
Hungary	0.68	49	0.62	0.40	0.78	0.83	0.80
Iran, Islamic Rep. of	0.55	41	0.60	0.33	0.72	0.75	0.69
Ireland	0.69	48	0.58	0.40	0.73	0.84	0.82
Italy	0.60	42	0.45	0.40	0.67	0.82	0.80
Japan	0.70	47	0.62	0.34	0.76	0.82	0.79
Kazakhstan	0.44	37	0.51	0.19	0.66	0.73	0.75

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item				
			ASBM02A	ASBM02B*	ASBM02C	ASBM02D	ASBM02E
Korea, Rep. of	0.71	48	0.57	0.44	0.72	0.84	0.80
Kuwait	0.50	37	0.39	0.35	0.69	0.78	0.72
Lithuania	0.57	41	0.61	0.31	0.68	0.75	0.75
Malta	0.65	46	0.60	0.38	0.70	0.80	0.81
Morocco	0.48	35	0.47	0.40	0.59	0.73	0.70
Netherlands	0.63	42	0.63	0.47	0.70	0.70	0.73
New Zealand	0.62	44	0.58	0.30	0.71	0.80	0.79
Northern Ireland	0.63	46	0.55	0.30	0.74	0.83	0.81
Norway	0.67	46	0.55	0.43	0.68	0.83	0.81
Oman	0.47	37	0.43	0.31	0.74	0.75	0.67
Poland	0.68	48	0.64	0.41	0.71	0.83	0.80
Portugal	0.62	45	0.60	0.42	0.70	0.79	0.77
Qatar	0.56	42	0.50	0.18	0.77	0.79	0.79
Romania	0.61	45	0.59	0.40	0.74	0.80	0.75
Russian Federation	0.62	44	0.54	0.40	0.75	0.78	0.77
Saudi Arabia	0.50	37	0.45	0.36	0.66	0.75	0.74
Serbia	0.66	45	0.53	0.49	0.69	0.80	0.78
Singapore	0.70	51	0.69	0.23	0.79	0.85	0.81
Slovak Republic	0.63	45	0.65	0.34	0.71	0.78	0.77
Slovenia	0.63	43	0.63	0.46	0.64	0.76	0.72
Spain	0.60	43	0.50	0.34	0.69	0.82	0.79
Sweden	0.65	46	0.46	0.41	0.70	0.84	0.85
Thailand	0.55	40	0.42	0.42	0.74	0.75	0.73
Tunisia	0.46	33	0.49	0.53	0.62	0.64	0.57
Turkey	0.37	30	0.57	0.36	0.64	0.63	0.50
United Arab Emirates	0.55	42	0.52	0.22	0.74	0.78	0.79
United States	0.63	44	0.53	0.37	0.71	0.81	0.78
Yemen	0.51	39	0.54	0.22	0.77	0.78	0.62
Sixth Grade Participants							
Botswana	0.53	37	0.58	0.31	0.66	0.69	0.70
Honduras	0.35	36	0.47	-0.01	0.65	0.76	0.76
Yemen	0.40	34	0.46	0.24	0.75	0.77	0.52
Benchmarking Participants							
Alberta, Canada	0.65	46	0.59	0.37	0.72	0.81	0.80
Ontario, Canada	0.64	44	0.55	0.38	0.71	0.80	0.78
Quebec, Canada	0.69	48	0.58	0.42	0.73	0.84	0.82
Abu Dhabi, UAE	0.53	40	0.49	0.25	0.72	0.78	0.77
Dubai, UAE	0.59	45	0.61	0.20	0.75	0.80	0.80
Florida, US	0.60	42	0.53	0.35	0.69	0.80	0.75
North Carolina, US	0.59	42	0.48	0.34	0.69	0.81	0.77

*Reverse coded.

Exhibit 6: Relationship Between the TIMSS 2011 Students Engaged in Mathematics Lessons 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 (η^2)
	(r)	(r ²)	
Armenia	0.25	0.06	0.06
Australia	0.16	0.03	0.03
Austria	0.04	0.00	0.00
Azerbaijan	0.24	0.06	0.04
Bahrain	0.17	0.03	0.04
Belgium (Flemish)	0.09	0.01	0.01
Chile	0.19	0.04	0.04
Chinese Taipei	0.12	0.01	0.01
Croatia	0.06	0.00	0.01
Czech Republic	0.05	0.00	0.01
Denmark	0.11	0.01	0.01
England	0.01	0.00	0.00
Finland	0.10	0.01	0.01
Georgia	0.17	0.03	0.04
Germany	0.08	0.01	0.01
Hong Kong SAR	0.16	0.03	0.03
Hungary	0.22	0.05	0.06
Iran, Islamic Rep. of	0.13	0.02	0.02
Ireland	0.11	0.01	0.01
Italy	0.13	0.02	0.02
Japan	0.07	0.00	0.01
Kazakhstan	0.17	0.03	0.04
Korea, Rep. of	0.20	0.04	0.03
Kuwait	0.17	0.03	0.04
Lithuania	0.11	0.01	0.02
Malta	0.24	0.06	0.06
Morocco	0.25	0.06	0.06
Netherlands	0.09	0.01	0.01
New Zealand	0.04	0.00	0.01
Northern Ireland	0.09	0.01	0.01
Norway	0.07	0.00	0.01
Oman	0.27	0.07	0.08
Poland	0.15	0.02	0.03
Portugal	0.20	0.04	0.03
Qatar	0.24	0.06	0.08
Romania	0.25	0.06	0.08
Russian Federation	0.12	0.02	0.02
Saudi Arabia	0.18	0.03	0.04

Exhibit 6: Relationship Between the TIMSS 2011 Students Engaged in Mathematics Lessons 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 (η^2)
	(r)	(r ²)	
Serbia	0.11	0.01	0.01
Singapore	0.18	0.03	0.04
Slovak Republic	0.12	0.01	0.02
Slovenia	0.10	0.01	0.02
Spain	0.18	0.03	0.04
Sweden	0.04	0.00	0.00
Thailand	0.15	0.02	0.03
Tunisia	0.23	0.05	0.05
Turkey	0.33	0.11	0.13
United Arab Emirates	0.18	0.03	0.05
United States	0.14	0.02	0.03
Yemen	0.21	0.05	0.04
International Median	0.15	0.02	0.03
Sixth Grade Participants			
Botswana	0.35	0.12	0.12
Honduras	0.03	0.00	0.00
Yemen	0.12	0.01	0.02
Benchmarking Participants			
Alberta, Canada	0.14	0.02	0.02
Ontario, Canada	0.11	0.01	0.02
Quebec, Canada	0.16	0.03	0.03
Abu Dhabi, UAE	0.18	0.03	0.04
Dubai, UAE	0.16	0.02	0.04
Florida, US	0.12	0.01	0.03
North Carolina, US	0.17	0.03	0.02