

TIMSS 2011

The TIMSS 2011 Students Engaged in Earth Science Lessons Scale, Eighth Grade

The Students Engaged in Earth Science Lessons (ESE) scale was created based on students' degree of agreement to the five statements described below. This scale was administered in countries where the sciences are taught as separate subjects. 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 Earth Science Lessons Scale, Eighth Grade

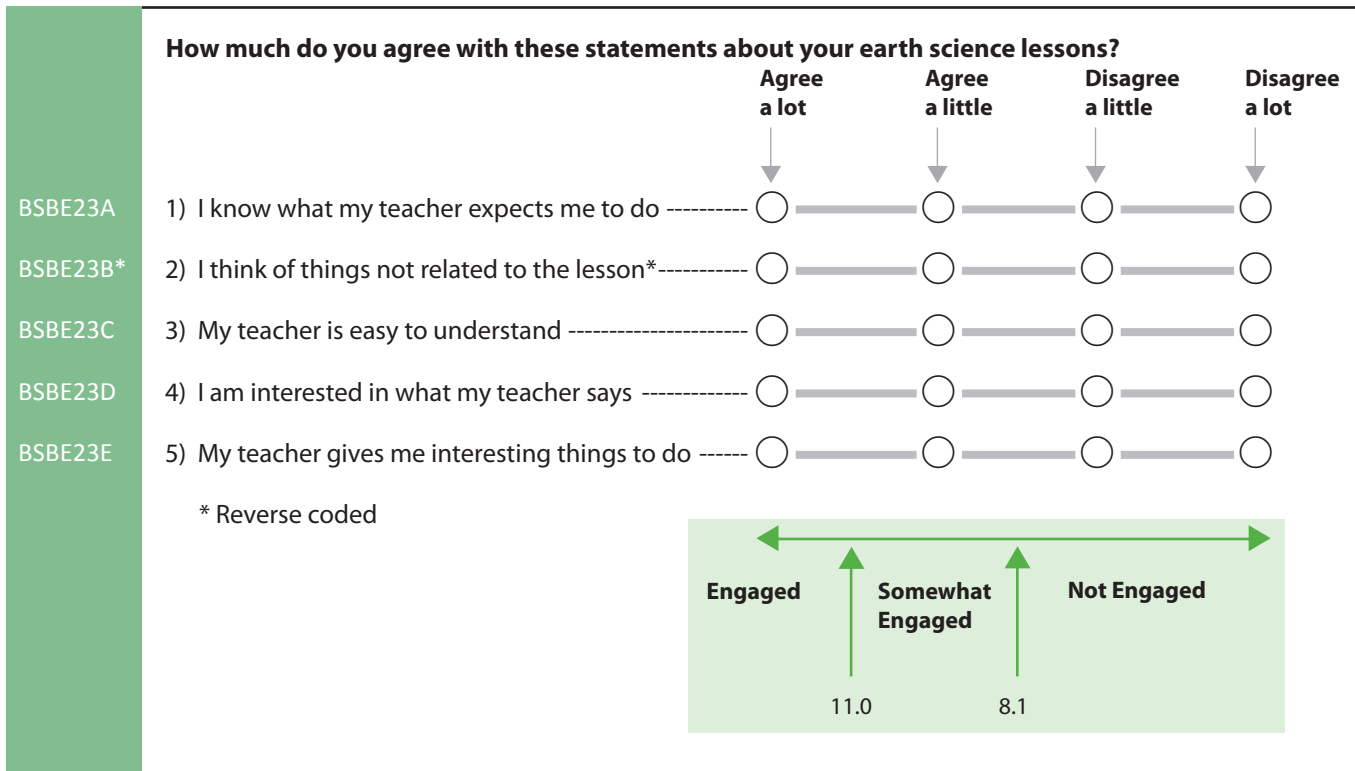


Exhibit 2: Item Parameters for the TIMSS 2011 Students Engaged in Earth Science Lessons Scale, Eighth Grade

Item	delta	tau_1	tau_2	tau_3
BSBE23A	-1.22242	-0.91700	-0.44456	1.36156
BSBE23B*	-0.50522	-1.17817	0.14908	1.02909
BSBE23C	-1.37366	-0.79981	-0.37180	1.17161
BSBE23D	-1.37674	-0.82620	-0.29233	1.11853
BSBE23E	-0.92368	-0.90199	-0.13744	1.03943

*Reverse coded

Exhibit 3: Scale Transformation Constants

Scale Transformation Constants

$$A = 10.02944$$

$$B = 1.50816$$

$$\text{Transformed Scale Score} = 10.02944 + 1.50816 \cdot \text{Logit Scale Score}$$

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	3.48543		8	8.48969	
1	5.10188		9	8.89955	
2	5.88738		10	9.33738	
3	6.44971		11	9.81863	
4	6.91226		12	10.36429	
5	7.32462		13	11.02662	11.0
6	7.71447		14	11.93930	
7	8.09905	8.1	15	13.72356	

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item				
			BSBE23A	BSBE23B*	BSBE23C	BSBE23D	BSBE23E
Armenia	0.68	50	0.55	0.32	0.83	0.85	0.82
Finland	0.80	57	0.72	0.49	0.80	0.87	0.83
Georgia	0.65	47	0.67	0.23	0.82	0.74	0.79
Hungary	0.81	58	0.71	0.55	0.83	0.87	0.82
Indonesia	0.68	50	0.67	0.07	0.80	0.85	0.83
Kazakhstan	0.73	51	0.68	0.40	0.75	0.82	0.82
Lebanon	-	-	-	-	-	-	-
Lithuania	0.81	58	0.78	0.48	0.84	0.85	0.81
Macedonia, Rep. of	0.69	50	0.68	0.28	0.82	0.84	0.76
Morocco	0.56	39	0.62	0.31	0.68	0.72	0.70

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item				
			BSBE23A	BSBE23B*	BSBE23C	BSBE23D	BSBE23E
Romania	0.77	55	0.71	0.42	0.82	0.86	0.81
Russian Federation	0.81	59	0.72	0.53	0.83	0.87	0.84
Slovenia	0.82	60	0.78	0.48	0.85	0.87	0.84
Sweden	0.78	56	0.69	0.37	0.82	0.87	0.86
Syrian Arab Republic	0.59	43	0.57	0.21	0.75	0.78	0.78
Ukraine	0.76	53	0.63	0.54	0.79	0.86	0.79

A dash (-) indicates that the item was not administered or comparable data was not available.

*Reverse coded

Exhibit 6: Relationship Between the TIMSS 2011 Students Engaged in Earth Science Lessons Scale, Eighth Grade, and TIMSS 2011 Science Achievement

Country	Pearson's Correlation with Science Achievement		Variance in Science Achievement Accounted for by Difference Between Regions of the Scale (η^2)
	(r)	(r ²)	
Armenia	0.14	0.02	0.03
Finland	0.21	0.04	0.04
Georgia	0.27	0.07	0.07
Hungary	-0.04	0.00	0.01
Indonesia	-0.08	0.01	0.00
Kazakhstan	0.15	0.02	0.03
Lebanon	-	-	-
Lithuania	0.05	0.00	0.01
Macedonia, Rep. of	0.16	0.03	0.04
Morocco	0.14	0.02	0.02
Romania	0.15	0.02	0.03
Russian Federation	0.06	0.00	0.00
Slovenia	0.05	0.00	0.00
Sweden	0.11	0.01	0.01
Syrian Arab Republic	0.18	0.03	0.04
Ukraine	0.11	0.01	0.01
International Median	0.14	0.02	0.02

A dash (-) indicates that the item was not administered or comparable data was not available.