The TIMSS 2011 Students Like Learning Earth Science Scale, Eighth Grade

The Students Like Learning Earth Science (SLE) 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 Like Learning Earth Science Scale, Eighth Grade
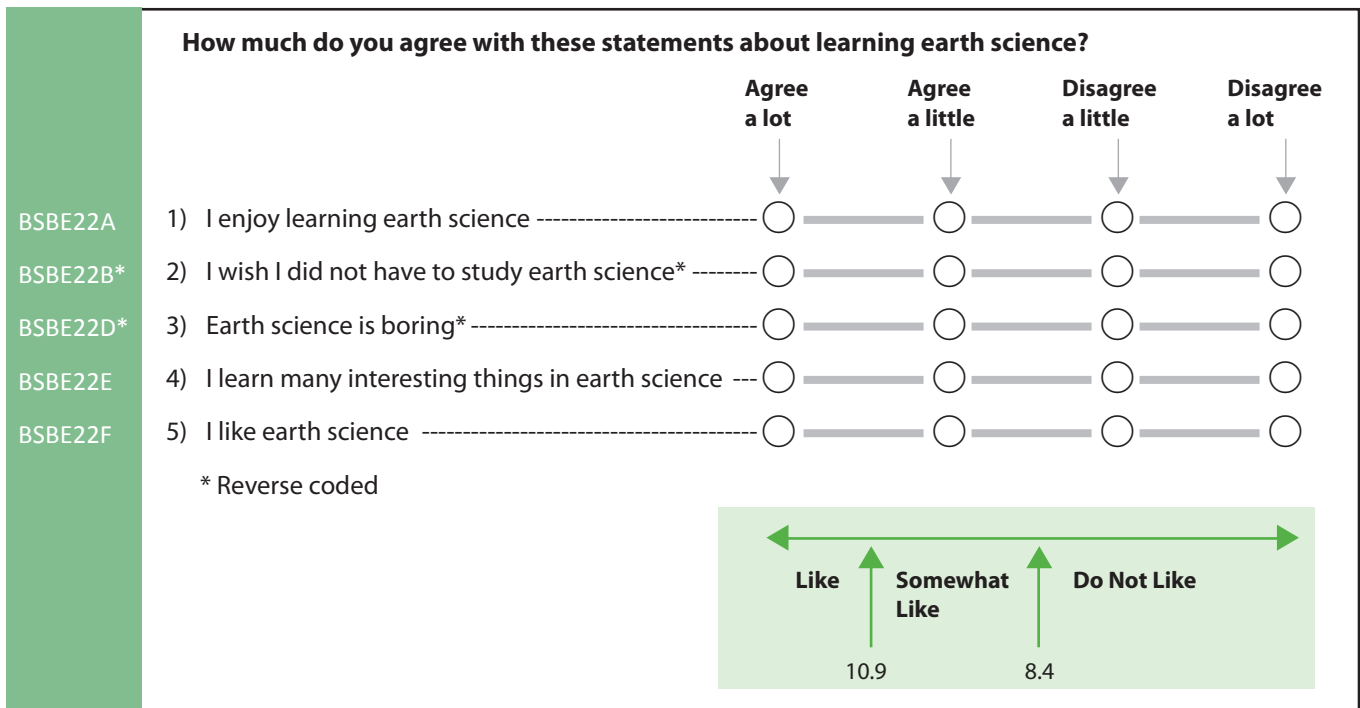

How much do you agree with these statements about learning earth science?

	Agree a lot	Agree a little	Disagree a little	Disagree a lot
BSBE22A	1) I enjoy learning earth science			
BSBE22B*	2) I wish I did not have to study earth science*			
BSBE22D*	3) Earth science is boring*			
BSBE22E	4) I learn many interesting things in earth science			
BSBE22F	5) I like earth science			

* Reverse coded

Like — Somewhat Like — Do Not Like

10.9   8.4

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

Item	delta	tau_1	tau_2	tau_3
BSBE22A	−1.41752	−1.38340	−0.31904	1.70244
BSBE22B*	−0.90290	−1.06999	−0.22402	1.29401
BSBE22D*	−1.00767	−1.17070	−0.23415	1.40485
BSBE22E	−1.69210	−1.18210	−0.41371	1.59581
BSBE22F	−1.23026	−1.27796	−0.29586	1.57382

*Reverse coded

Exhibit 3: Scale Transformation Constants

Scale Transformation Constants	
A = 10.05306	Transformed Scale Score = 10.05306 + 1.18022 · Logit Scale Score
B = 1.18022	

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	4.31864		8	8.65345	
1	5.66418		9	9.02130	
2	6.34103		10	9.41690	
3	6.83440		11	9.85298	
4	7.24444		12	10.34541	
5	7.61218		13	10.93109	10.9
6	7.96044		14	11.71195	
7	8.30391	8.4	15	13.17254	

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item				
			BSBE22A	BSBE22B*	BSBE22D*	BSBE22E	BSBE22F
Armenia	0.80	57	0.80	0.68	0.67	0.76	0.84
Finland	0.91	73	0.88	0.81	0.84	0.84	0.91
Georgia	0.75	52	0.80	0.57	0.61	0.75	0.83
Hungary	0.88	68	0.86	0.74	0.80	0.81	0.89
Indonesia	0.77	53	0.79	0.53	0.68	0.76	0.83
Kazakhstan	0.78	55	0.79	0.64	0.63	0.80	0.84
Lebanon	–	–	–	–	–	–	–
Lithuania	0.88	68	0.86	0.74	0.80	0.81	0.89
Macedonia, Rep. of	0.74	53	0.82	0.45	0.59	0.81	0.86
Morocco	0.67	46	0.77	0.43	0.63	0.67	0.81
Romania	0.81	59	0.83	0.56	0.72	0.79	0.89

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item				
			BSBE22A	BSBE22B*	BSBE22D*	BSBE22E	BSBE22F
Russian Federation	0.84	63	0.83	0.64	0.78	0.80	0.88
Slovenia	0.89	71	0.87	0.76	0.83	0.84	0.89
Sweden	0.88	69	0.86	0.71	0.83	0.83	0.89
Syrian Arab Republic	0.61	44	0.76	0.21	0.47	0.78	0.85
Ukraine	0.87	66	0.83	0.74	0.81	0.78	0.88

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 Like Learning Earth Science 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	0.16	0.02	0.03
Finland	0.25	0.06	0.05
Georgia	0.24	0.06	0.05
Hungary	−0.02	0.00	0.01
Indonesia	−0.05	0.00	0.00
Kazakhstan	0.15	0.02	0.02
Lebanon	–	–	–
Lithuania	0.14	0.02	0.02
Macedonia, Rep. of	0.19	0.04	0.06
Morocco	0.16	0.03	0.03
Romania	0.19	0.04	0.04
Russian Federation	0.05	0.00	0.00
Slovenia	0.08	0.01	0.01
Sweden	0.16	0.02	0.01
Syrian Arab Republic	0.20	0.04	0.04
Ukraine	0.11	0.01	0.01
International Median	**0.16**	**0.02**	**0.02**

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