

TIMSS 2011

The TIMSS 2011 Students Like Learning Science Scale, Fourth Grade

The Students Like Learning Science (SLS) 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 Science Scale, Fourth Grade

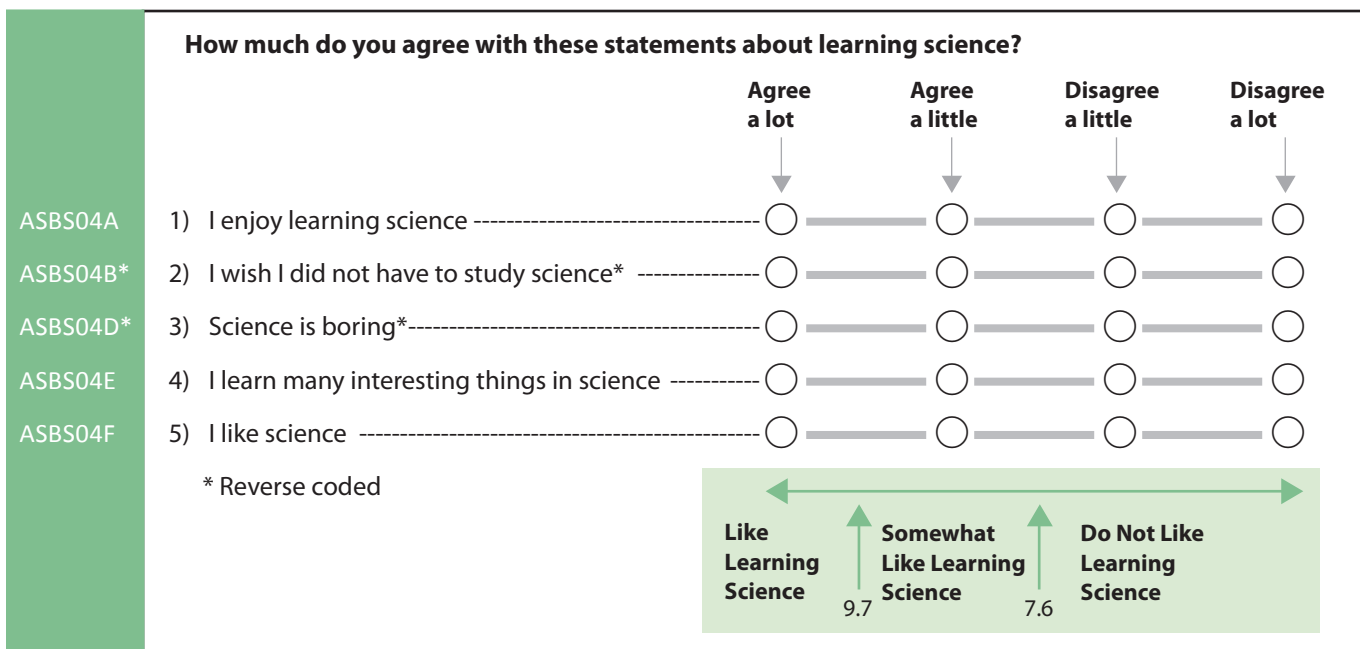


Exhibit 2: Item Parameters for the TIMSS 2011 Students Like Learning Science Scale, Fourth Grade

Item	delta	tau_1	tau_2	tau_3
ASBS04A	-2.02601	-0.35273	-0.53495	0.88768
ASBS04B*	-1.32655	-0.27690	-0.07772	0.35462
ASBS04D*	-1.50872	-0.37047	-0.04872	0.41919
ASBS04E	-2.29467	-0.32949	-0.35447	0.68396
ASBS04F	-1.88495	-0.35512	-0.36390	0.71902

* Reverse coded

Exhibit 3: Scale Transformation Constants

Scale Transformation Constants

$$A = 10.48562$$

$$B = 1.49093$$

$$\text{Transformed Scale Score} = 10.48562 + 1.49093 \cdot \text{Logit Scale Score}$$

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	3.78524		8	7.89556	
1	5.14599		9	8.20256	
2	5.80045		10	8.52141	
3	6.26422		11	8.86813	
4	6.64663		12	9.27497	
5	6.98304		13	9.78205	9.7
6	7.29493		14	10.53513	
7	7.59835	7.6	15	12.16866	

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item				
			ASBS04A	ASBS04B*	ASBS04D*	ASBS04E	ASBS04F
Armenia	0.70	47	0.70	0.53	0.52	0.78	0.83
Australia	0.88	68	0.86	0.75	0.82	0.79	0.90
Austria	0.86	65	0.83	0.74	0.80	0.77	0.88
Azerbaijan	0.48	41	0.74	0.14	0.49	0.77	0.81
Bahrain	0.76	53	0.76	0.61	0.69	0.74	0.83
Belgium (Flemish)	0.90	72	0.88	0.84	0.88	0.71	0.92
Chile	0.78	56	0.79	0.62	0.74	0.73	0.84
Chinese Taipei	0.86	65	0.86	0.75	0.70	0.81	0.88
Croatia	0.87	68	0.87	0.73	0.83	0.79	0.90
Czech Republic	0.86	66	0.88	0.71	0.83	0.72	0.90
Denmark	0.90	73	0.88	0.79	0.84	0.84	0.90
England	0.89	69	0.88	0.76	0.82	0.78	0.92
Finland	0.91	73	0.88	0.79	0.87	0.81	0.91
Georgia	0.72	51	0.78	0.64	0.63	0.67	0.82
Germany	0.89	70	0.85	0.82	0.83	0.80	0.90
Hong Kong SAR	0.84	61	0.82	0.66	0.73	0.81	0.88
Hungary	0.86	65	0.86	0.70	0.79	0.77	0.89
Iran, Islamic Rep. of	0.74	51	0.74	0.68	0.68	0.70	0.77
Ireland	0.87	66	0.87	0.71	0.81	0.77	0.90

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item				
			ASBS04A	ASBS04B*	ASBS04D*	ASBS04E	ASBS04F
Italy	0.85	63	0.84	0.73	0.77	0.73	0.87
Japan	0.86	65	0.86	0.74	0.78	0.76	0.88
Kazakhstan	0.72	50	0.76	0.63	0.60	0.74	0.79
Korea, Rep. of	0.90	71	0.88	0.79	0.84	0.81	0.89
Kuwait	0.74	51	0.74	0.64	0.69	0.70	0.78
Lithuania	0.84	63	0.82	0.75	0.77	0.75	0.87
Malta	0.84	63	0.85	0.65	0.77	0.77	0.89
Morocco	0.59	39	0.61	0.59	0.63	0.62	0.67
Netherlands	0.88	69	0.86	0.80	0.85	0.70	0.90
New Zealand	0.85	63	0.84	0.73	0.74	0.76	0.88
Northern Ireland	0.85	64	0.85	0.71	0.77	0.77	0.89
Norway	0.88	69	0.87	0.74	0.83	0.80	0.90
Oman	0.64	44	0.68	0.53	0.64	0.69	0.76
Poland	0.83	62	0.83	0.66	0.75	0.81	0.87
Portugal	0.82	60	0.79	0.71	0.76	0.75	0.84
Qatar	0.72	50	0.70	0.59	0.64	0.77	0.80
Romania	0.78	57	0.78	0.63	0.74	0.75	0.84
Russian Federation	0.80	59	0.81	0.66	0.80	0.72	0.84
Saudi Arabia	0.76	52	0.73	0.66	0.72	0.70	0.80
Serbia	0.84	63	0.83	0.68	0.78	0.78	0.87
Singapore	0.87	67	0.85	0.78	0.80	0.77	0.88
Slovak Republic	0.84	63	0.84	0.71	0.81	0.69	0.88
Slovenia	0.86	66	0.85	0.72	0.80	0.79	0.89
Spain	0.83	60	0.82	0.69	0.78	0.73	0.86
Sweden	0.90	71	0.87	0.78	0.86	0.80	0.91
Thailand	0.74	50	0.70	0.68	0.73	0.69	0.75
Tunisia	0.66	45	0.65	0.67	0.69	0.66	0.68
Turkey	0.65	46	0.74	0.65	0.74	0.42	0.76
United Arab Emirates	0.75	53	0.76	0.60	0.68	0.76	0.82
United States	0.88	68	0.87	0.75	0.82	0.77	0.90
Yemen	0.61	41	0.67	0.53	0.46	0.73	0.77
Sixth Grade Participants							
Botswana	0.68	45	0.70	0.61	0.68	0.66	0.70
Honduras	0.58	40	0.72	0.42	0.50	0.68	0.78
Yemen	0.63	42	0.68	0.56	0.55	0.71	0.73

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item				
			ASBS04A	ASBS04B*	ASBS04D*	ASBS04E	ASBS04F
Benchmarking Participants							
Alberta, Canada	0.86	66	0.86	0.71	0.83	0.76	0.89
Ontario, Canada	0.87	67	0.86	0.74	0.82	0.77	0.90
Quebec, Canada	0.88	68	0.87	0.74	0.82	0.79	0.90
Abu Dhabi, UAE	0.73	50	0.75	0.56	0.64	0.75	0.82
Dubai, UAE	0.79	57	0.79	0.63	0.72	0.76	0.84
Florida, US	0.88	68	0.88	0.74	0.82	0.78	0.90
North Carolina, US	0.85	64	0.86	0.73	0.79	0.72	0.90

* Reverse coded

Exhibit 6: Relationship Between the TIMSS 2011 Students Like Learning Science Scale, Fourth 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	0.24	0.06	0.05
Australia	0.17	0.03	0.03
Austria	0.11	0.01	0.01
Azerbaijan	0.26	0.07	0.04
Bahrain	0.31	0.09	0.10
Belgium (Flemish)	0.14	0.02	0.01
Chile	0.22	0.05	0.06
Chinese Taipei	0.19	0.04	0.04
Croatia	0.07	0.00	0.01
Czech Republic	0.08	0.01	0.01
Denmark	0.05	0.00	0.00
England	0.08	0.01	0.01
Finland	0.10	0.01	0.01
Georgia	0.33	0.11	0.10
Germany	0.12	0.01	0.01
Hong Kong SAR	0.24	0.06	0.05
Hungary	0.21	0.04	0.04
Iran, Islamic Rep. of	0.28	0.08	0.08
Ireland	0.19	0.03	0.03
Italy	0.12	0.01	0.01
Japan	0.14	0.02	0.02

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

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)	
Kazakhstan	0.19	0.04	0.03
Korea, Rep. of	0.25	0.06	0.06
Kuwait	0.26	0.07	0.09
Lithuania	0.17	0.03	0.03
Malta	0.24	0.06	0.07
Morocco	0.32	0.10	0.09
Netherlands	0.09	0.01	0.01
New Zealand	0.20	0.04	0.04
Northern Ireland	0.23	0.05	0.06
Norway	0.14	0.02	0.02
Oman	0.39	0.15	0.13
Poland	0.14	0.02	0.02
Portugal	0.23	0.06	0.05
Qatar	0.39	0.15	0.16
Romania	0.28	0.08	0.07
Russian Federation	0.14	0.02	0.02
Saudi Arabia	0.32	0.10	0.11
Serbia	0.10	0.01	0.01
Singapore	0.22	0.05	0.04
Slovak Republic	0.13	0.02	0.02
Slovenia	0.07	0.01	0.01
Spain	0.14	0.02	0.03
Sweden	0.05	0.00	0.00
Thailand	0.32	0.10	0.09
Tunisia	0.42	0.18	0.15
Turkey	0.38	0.15	0.13
United Arab Emirates	0.35	0.12	0.13
United States	0.14	0.02	0.02
Yemen	0.34	0.12	0.10
International Median	0.20	0.04	0.04
Sixth Grade Participants			
Botswana	0.59	0.35	0.31
Honduras	0.30	0.09	0.09
Yemen	0.35	0.12	0.11

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

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)	
Benchmarking Participants			
Alberta, Canada	0.14	0.02	0.02
Ontario, Canada	0.12	0.01	0.02
Quebec, Canada	0.14	0.02	0.02
Abu Dhabi, UAE	0.35	0.12	0.14
Dubai, UAE	0.33	0.11	0.11
Florida, US	0.14	0.02	0.02
North Carolina, US	0.15	0.02	0.02