

TIMSS 2011

The TIMSS 2011 Students Confident in Science Scale, Fourth Grade

The Students Confident in Science (SCS) scale was created based on students' degree of agreement with the six 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 Confident in Science Scale, Fourth Grade

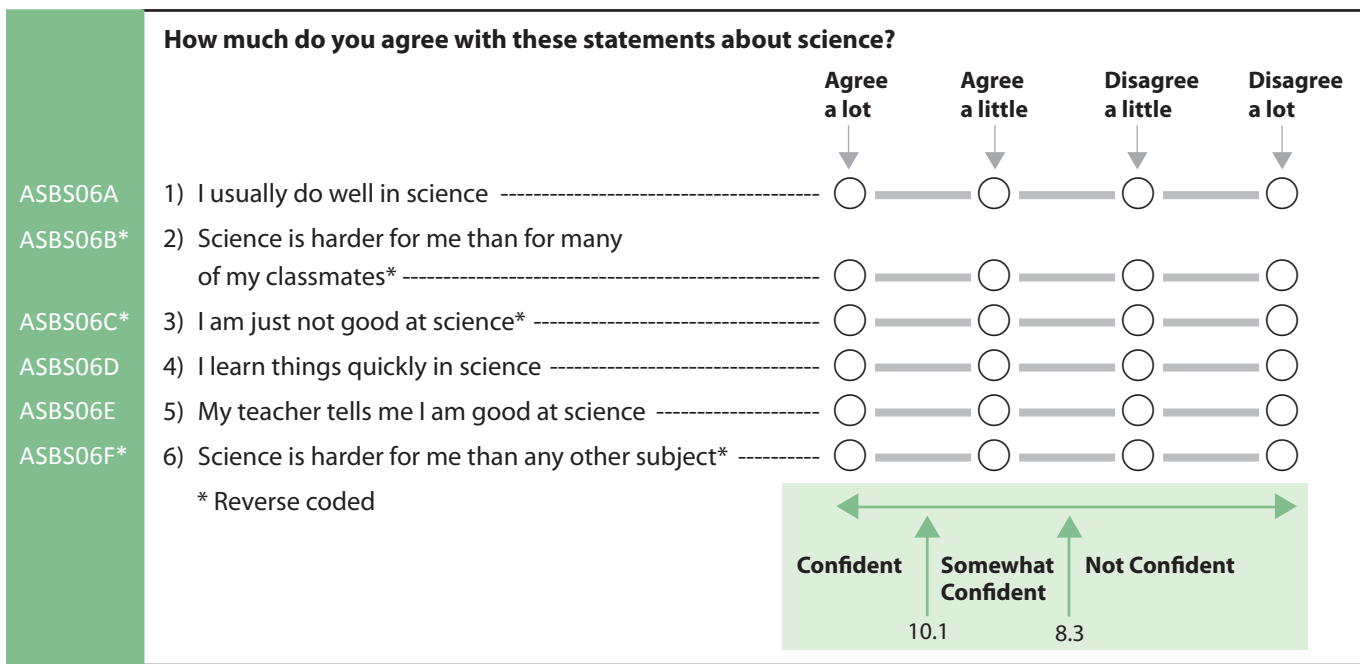


Exhibit 2: Item Parameters for the TIMSS 2011 Students Confident in Science Scale, Fourth Grade

Item	delta	tau_1	tau_2	tau_3
ASBS06A	-1.42346	-0.39065	-0.58635	0.97700
ASBS06B*	-0.90539	-0.47039	0.19412	0.27627
ASBS06C*	-0.90130	-0.31894	0.12019	0.19875
ASBS06D	-1.25599	-0.63879	-0.26153	0.90032
ASBS06E	-0.80838	-0.72822	-0.24389	0.97211
ASBS06F*	-0.93206	-0.13262	0.11789	0.01473

*Reverse coded

Exhibit 3: Scale Transformation Constants

Scale Transformation Constants

$$A = 10.00333$$

$$B = 1.66788$$

$$\text{Transformed Scale Score} = 10.00333 + 1.66788 \cdot \text{Logit Scale Score}$$

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	3.33171		10	8.53764	
1	4.99640		11	8.80430	
2	5.77808		12	9.09004	
3	6.31796		13	9.40016	
4	6.74535		14	9.75510	
5	7.10728		15	10.17849	10.1
6	7.43155		16	10.73922	
7	7.72742		17	11.59347	
8	8.00497		18	13.45269	
9	8.27256	8.3			

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item					
			ASBS06A	ASBS06B*	ASBS06C*	ASBS06D	ASBS06E	ASBS06F*
Armenia	0.70	41	0.69	0.59	0.61	0.70	0.68	0.55
Australia	0.80	51	0.75	0.73	0.75	0.74	0.57	0.71
Austria	0.83	54	0.77	0.75	0.69	0.76	0.69	0.75
Azerbaijan	0.65	37	0.50	0.71	0.48	0.64	0.62	0.69
Bahrain	0.64	36	0.40	0.71	0.59	0.60	0.53	0.71
Belgium (Flemish)	0.84	56	0.80	0.76	0.80	0.76	0.61	0.74
Chile	0.69	40	0.64	0.67	0.66	0.67	0.46	0.66
Chinese Taipei	0.80	51	0.73	0.70	0.74	0.74	0.63	0.72
Croatia	0.85	58	0.79	0.76	0.79	0.76	0.74	0.73
Czech Republic	0.85	58	0.78	0.76	0.80	0.79	0.68	0.77
Denmark	0.80	51	0.79	0.73	0.78	0.74	0.58	0.67
England	0.82	54	0.78	0.73	0.82	0.78	0.53	0.74
Finland	0.84	56	0.80	0.74	0.78	0.78	0.64	0.72
Georgia	0.74	44	0.64	0.72	0.76	0.62	0.52	0.71
Germany	0.84	55	0.78	0.76	0.74	0.75	0.70	0.73
Hong Kong SAR	0.79	49	0.70	0.69	0.76	0.71	0.59	0.73
Hungary	0.86	59	0.78	0.77	0.79	0.76	0.76	0.75
Iran, Islamic Rep. of	0.75	45	0.65	0.70	0.72	0.64	0.64	0.69

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item					
			ASBS06A	ASBS06B*	ASBS06C*	ASBS06D	ASBS06E	ASBS06F*
Ireland	0.79	50	0.75	0.74	0.76	0.75	0.54	0.70
Italy	0.75	46	0.73	0.66	0.47	0.78	0.70	0.69
Japan	0.79	49	0.71	0.71	0.81	0.73	0.49	0.72
Kazakhstan	0.79	49	0.69	0.74	0.73	0.69	0.65	0.71
Korea, Rep. of	0.84	56	0.83	0.78	0.78	0.72	0.63	0.71
Kuwait	0.62	36	0.17	0.78	0.75	0.43	0.40	0.79
Lithuania	0.79	50	0.76	0.72	0.74	0.70	0.60	0.71
Malta	0.82	53	0.74	0.73	0.74	0.73	0.70	0.72
Morocco	0.53	31	0.15	0.74	0.64	0.41	0.40	0.73
Netherlands	0.79	49	0.75	0.68	0.76	0.71	0.57	0.71
New Zealand	0.77	47	0.73	0.67	0.74	0.73	0.57	0.66
Northern Ireland	0.79	50	0.76	0.72	0.78	0.75	0.52	0.69
Norway	0.80	51	0.78	0.72	0.72	0.74	0.60	0.71
Oman	0.68	39	0.47	0.74	0.70	0.55	0.52	0.71
Poland	0.81	52	0.73	0.74	0.73	0.77	0.62	0.71
Portugal	0.77	48	0.72	0.66	0.71	0.74	0.67	0.62
Qatar	0.70	40	0.26	0.82	0.77	0.49	0.46	0.79
Romania	0.78	49	0.73	0.68	0.71	0.68	0.66	0.71
Russian Federation	0.85	57	0.78	0.76	0.78	0.79	0.69	0.73
Saudi Arabia	0.67	38	0.28	0.77	0.75	0.55	0.49	0.73
Serbia	0.81	52	0.72	0.71	0.74	0.75	0.68	0.73
Singapore	0.82	54	0.76	0.76	0.75	0.73	0.62	0.75
Slovak Republic	0.82	53	0.74	0.71	0.79	0.74	0.65	0.73
Slovenia	0.82	54	0.76	0.74	0.67	0.75	0.73	0.75
Spain	0.79	50	0.74	0.72	0.71	0.68	0.67	0.70
Sweden	0.80	50	0.77	0.71	0.74	0.74	0.58	0.72
Thailand	0.66	38	0.62	0.60	0.65	0.62	0.61	0.58
Tunisia	0.51	33	-0.04	0.71	0.55	0.56	0.54	0.74
Turkey	0.71	41	0.59	0.71	0.74	0.57	0.56	0.66
United Arab Emirates	0.69	40	0.49	0.74	0.65	0.59	0.54	0.73
United States	0.81	52	0.74	0.76	0.78	0.73	0.56	0.75
Yemen	0.62	35	0.45	0.67	0.65	0.53	0.55	0.67
Sixth Grade Participants								
Botswana	0.68	39	0.61	0.66	0.68	0.57	0.52	0.67
Honduras	0.57	34	0.02	0.85	0.77	0.01	-0.15	0.83
Yemen	0.66	37	0.47	0.66	0.66	0.58	0.57	0.69

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item					
			ASBS06A	ASBS06B*	ASBS06C*	ASBS06D	ASBS06E	ASBS06F*
Benchmarking Participants								
Alberta, Canada	0.79	50	0.74	0.76	0.79	0.70	0.49	0.74
Ontario, Canada	0.81	52	0.74	0.76	0.79	0.73	0.54	0.75
Quebec, Canada	0.81	53	0.79	0.73	0.69	0.77	0.61	0.74
Abu Dhabi, UAE	0.66	37	0.39	0.74	0.65	0.54	0.50	0.75
Dubai, UAE	0.73	43	0.61	0.73	0.65	0.65	0.58	0.72
Florida, US	0.82	53	0.73	0.78	0.77	0.75	0.58	0.74
North Carolina, US	0.79	50	0.69	0.77	0.76	0.70	0.54	0.76

*Reverse coded.

Exhibit 6: Relationship Between the TIMSS 2011 Students Confident in 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	0.25	0.06	0.06
Australia	0.20	0.04	0.06
Austria	0.29	0.08	0.12
Azerbaijan	0.33	0.11	0.10
Bahrain	0.31	0.09	0.12
Belgium (Flemish)	0.26	0.07	0.09
Chile	0.34	0.12	0.13
Chinese Taipei	0.26	0.07	0.10
Croatia	0.29	0.08	0.08
Czech Republic	0.26	0.07	0.07
Denmark	0.13	0.02	0.02
England	0.19	0.04	0.04
Finland	0.21	0.04	0.07
Georgia	0.37	0.14	0.14
Germany	0.28	0.08	0.10
Hong Kong SAR	0.20	0.04	0.06
Hungary	0.40	0.16	0.16
Iran, Islamic Rep. of	0.31	0.10	0.11
Ireland	0.19	0.04	0.06
Italy	0.20	0.04	0.04
Japan	0.22	0.05	0.05
Kazakhstan	0.15	0.02	0.02
Korea, Rep. of	0.34	0.11	0.12
Kuwait	0.28	0.08	0.10

Exhibit 6: Relationship Between the TIMSS 2011 Students Confident in 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)	
Lithuania	0.28	0.08	0.09
Malta	0.30	0.09	0.11
Morocco	0.24	0.06	0.07
Netherlands	0.25	0.06	0.06
New Zealand	0.26	0.07	0.10
Northern Ireland	0.26	0.07	0.09
Norway	0.18	0.03	0.05
Oman	0.41	0.16	0.17
Poland	0.29	0.09	0.11
Portugal	0.34	0.12	0.12
Qatar	0.36	0.13	0.16
Romania	0.38	0.14	0.16
Russian Federation	0.26	0.07	0.07
Saudi Arabia	0.34	0.11	0.11
Serbia	0.27	0.07	0.10
Singapore	0.28	0.08	0.10
Slovak Republic	0.29	0.09	0.10
Slovenia	0.33	0.11	0.11
Spain	0.29	0.08	0.10
Sweden	0.16	0.03	0.04
Thailand	0.16	0.03	0.02
Tunisia	0.26	0.07	0.10
Turkey	0.41	0.17	0.17
United Arab Emirates	0.31	0.09	0.11
United States	0.27	0.07	0.09
Yemen	0.33	0.11	0.11
International Median	0.28	0.08	0.10
Sixth Grade Participants			
Botswana	0.41	0.17	0.18
Honduras	0.33	0.11	0.11
Yemen	0.29	0.09	0.10
Benchmarking Participants			
Alberta, Canada	0.24	0.06	0.07
Ontario, Canada	0.24	0.06	0.06
Quebec, Canada	0.19	0.03	0.05
Abu Dhabi, UAE	0.34	0.11	0.12

Exhibit 6: Relationship Between the TIMSS 2011 Students Confident in 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)	
Dubai, UAE	0.27	0.07	0.10
Florida, US	0.25	0.06	0.07
North Carolina, US	0.25	0.06	0.08