

Students Confident in Science Scale, Eighth Grade

The Students Confident in Science (SCS) scale was created based on students’ degree of agreement with the eight statements described below.

Items in the TIMSS 2015 Students Confident in Science Scale, Eighth Grade

		How much do you agree with these statements about science?			
		Agree a lot	Agree a little	Disagree a little	Disagree a lot
T	BSBS23A	1) I usually do well in science ----- ○ ———— ○ ———— ○ ———— ○			
T	BSBS23B*	2) Science is more difficult for me than for many of my classmates* ----- ○ ———— ○ ———— ○ ———— ○			
T	BSBS23C*	3) Science is not one of my strengths* ----- ○ ———— ○ ———— ○ ———— ○			
T	BSBS23D	4) I learn things quickly in science ----- ○ ———— ○ ———— ○ ———— ○			
T	BSBS23E	5) I am good at working out difficult science problems ----- ○ ———— ○ ———— ○ ———— ○			
T	BSBS23F	6) My teacher tells me I am good at science ----- ○ ———— ○ ———— ○ ———— ○			
T	BSBS23G*	7) Science is harder for me than any other subject* ----- ○ ———— ○ ———— ○ ———— ○			
T	BSBS23H*	8) Science makes me confused* ----- ○ ———— ○ ———— ○ ———— ○			

* Reverse coded

T Trend item—item was included in the same scale in TIMSS 2011 and was used for linking the TIMSS 2011 and TIMSS 2015 scales.

Item Parameters for the TIMSS 2015 Students Confident in Science Scale, Eighth Grade

Item	delta	tau_1	tau_2	tau_3	Infit
BSBS23A	-0.40602	-0.90090	-0.39226	1.29316	0.92
BSBS23B*	0.02223	-1.15732	0.20137	0.95595	1.05
BSBS23C*	0.27706	-1.01187	0.22919	0.78268	1.05
BSBS23D	-0.24566	-1.21791	-0.02344	1.24135	0.90
BSBS23E	0.17088	-1.28471	0.00993	1.27478	1.02
BSBS23F	0.09152	-1.12464	0.01922	1.10542	1.10
BSBS23G*	0.03010	-0.88164	0.03964	0.84200	1.02
BSBS23H*	0.05989	-0.92434	0.16959	0.75475	1.06

*Reverse coded

Scale Transformation Constants for the TIMSS 2015 Students Confident in Science Scale, Eighth Grade

Scale Transformation Constants	
A = 9.091884	Transformed Scale Score = 9.091884 + 1.615239 • Logit Scale Score
B = 1.615239	

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

**Equivalence Table of Raw and Transformed Scale Scores for the TIMSS
2015 Students Confident in Science Scale, Eighth Grade**

Raw Score	Transformed Scale Score	Cutpoint
0	2.82098	
1	4.65523	
2	5.54634	
3	6.15963	
4	6.64373	
5	7.05126	
6	7.40989	
7	7.73394	
8	8.03689	
9	8.32242	
10	8.59538	
11	8.85979	
12	9.12033	9.2
13	9.37683	
14	9.63617	
15	9.90101	
16	10.17585	
17	10.46634	
18	10.77961	
19	11.12175	
20	11.51463	11.5
21	11.98495	
22	12.58681	
23	13.46826	
24	15.29598	

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015



Cronbach's Alpha Reliability Coefficient and Principal Components Analysis of the Items in the TIMSS 2015 Students Confident in Science Scale, Eighth Grade

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Component Loadings for Each Item								
			BS8S23A	BS8S23B*	BS8S23C*	BS8S23D	BS8S23E	BS8S23F	BS8S23G*	BS8S23H*	
Australia	0.90	58	0.79	0.73	0.79	0.80	0.78	0.67	0.75	0.75	
Bahrain	0.76	37	0.49	0.64	0.59	0.65	0.57	0.60	0.68	0.63	
Botswana (9)	0.72	34	0.69	0.43	0.46	0.68	0.68	0.66	0.46	0.51	
Canada	0.89	58	0.79	0.75	0.81	0.81	0.78	0.63	0.75	0.75	
Chile	0.81	43	0.76	0.51	0.56	0.78	0.74	0.65	0.58	0.63	
Chinese Taipei	0.93	67	0.85	0.79	0.84	0.85	0.82	0.79	0.81	0.78	
Egypt	0.68	31	0.09	0.78	0.68	0.37	0.26	0.31	0.78	0.72	
England	0.90	59	0.80	0.75	0.81	0.82	0.78	0.64	0.77	0.76	
Georgia	-	-	-	-	-	-	-	-	-	-	
Hong Kong SAR	0.88	55	0.79	0.73	0.78	0.77	0.76	0.65	0.77	0.69	
Hungary	-	-	-	-	-	-	-	-	-	-	
Iran, Islamic Rep. of	0.82	45	0.73	0.57	0.60	0.75	0.71	0.70	0.65	0.66	
Ireland	0.91	61	0.83	0.78	0.80	0.83	0.78	0.67	0.78	0.76	
Israel	0.86	51	0.78	0.68	0.69	0.78	0.75	0.69	0.68	0.68	
Italy	0.88	55	0.79	0.71	0.78	0.81	0.69	0.69	0.73	0.71	
Japan	0.89	58	0.79	0.73	0.82	0.76	0.78	0.68	0.76	0.74	
Jordan	0.72	34	0.30	0.71	0.65	0.54	0.48	0.51	0.69	0.65	
Kazakhstan	-	-	-	-	-	-	-	-	-	-	
Korea, Rep. of	0.93	66	0.86	0.79	0.84	0.81	0.84	0.81	0.80	0.76	
Kuwait	0.79	41	0.55	0.66	0.57	0.71	0.67	0.64	0.65	0.63	
Lebanon	-	-	-	-	-	-	-	-	-	-	
Lithuania	-	-	-	-	-	-	-	-	-	-	
Malaysia	0.67	30	0.60	0.48	0.57	0.56	0.57	0.40	0.59	0.59	
Malta	-	-	-	-	-	-	-	-	-	-	
Morocco	-	-	-	-	-	-	-	-	-	-	
New Zealand	0.88	54	0.78	0.72	0.77	0.78	0.75	0.64	0.74	0.69	
Norway (9)	0.90	60	0.81	0.76	0.82	0.82	0.79	0.69	0.75	0.72	
Oman	0.74	36	0.37	0.76	0.66	0.52	0.39	0.44	0.76	0.72	
Qatar	0.78	39	0.65	0.60	0.54	0.73	0.67	0.67	0.59	0.55	
Russian Federation	-	-	-	-	-	-	-	-	-	-	
Saudi Arabia	0.71	34	0.20	0.77	0.66	0.43	0.30	0.37	0.79	0.76	
Singapore	0.91	62	0.83	0.79	0.83	0.80	0.79	0.69	0.79	0.76	
Slovenia	-	-	-	-	-	-	-	-	-	-	
South Africa (9)	0.78	40	0.68	0.54	0.60	0.71	0.69	0.61	0.57	0.61	
Sweden	-	-	-	-	-	-	-	-	-	-	
Thailand	0.73	35	0.78	0.14	0.27	0.85	0.83	0.77	0.13	0.20	
Turkey	0.84	48	0.75	0.69	0.70	0.72	0.67	0.65	0.67	0.68	
United Arab Emirates	0.82	44	0.64	0.65	0.66	0.72	0.67	0.63	0.67	0.65	
United States	0.88	54	0.75	0.75	0.76	0.79	0.73	0.60	0.76	0.74	
Benchmarking Participants											
Buenos Aires, Argentina	0.78	40	0.71	0.56	0.43	0.77	0.69	0.62	0.63	0.61	
Ontario, Canada	0.90	58	0.79	0.75	0.81	0.81	0.78	0.62	0.76	0.76	
Quebec, Canada	0.90	59	0.79	0.76	0.83	0.82	0.77	0.65	0.74	0.76	
Norway (8)	0.89	57	0.81	0.75	0.80	0.81	0.78	0.65	0.71	0.71	
Abu Dhabi, UAE	0.79	40	0.61	0.60	0.63	0.70	0.65	0.64	0.61	0.62	
Dubai, UAE	0.86	51	0.72	0.71	0.71	0.77	0.72	0.65	0.73	0.69	
Florida, US	0.85	50	0.73	0.71	0.73	0.77	0.70	0.58	0.72	0.71	

*Reverse coded

A dash (-) indicates comparable data not available.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Relationship Between the TIMSS 2015 Students Confident in Science Scale, Eighth Grade, and TIMSS 2015 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)	
Australia	0.39	0.15	0.16
Bahrain	0.38	0.15	0.16
Botswana (9)	0.26	0.07	0.08
Canada	0.35	0.12	0.12
Chile	0.24	0.06	0.08
Chinese Taipei	0.38	0.15	0.18
Egypt	0.41	0.16	0.16
England	0.39	0.15	0.15
Georgia	-	-	-
Hong Kong SAR	0.31	0.09	0.12
Hungary	-	-	-
Iran, Islamic Rep. of	0.31	0.10	0.10
Ireland	0.49	0.24	0.23
Israel	0.38	0.15	0.18
Italy	0.31	0.10	0.10
Japan	0.37	0.14	0.14
Jordan	0.39	0.15	0.15
Kazakhstan	-	-	-
Korea, Rep. of	0.45	0.20	0.23
Kuwait	0.36	0.13	0.12
Lebanon	-	-	-
Lithuania	-	-	-
Malaysia	-0.16	0.03	0.02
Malta	-	-	-
Morocco	-	-	-
New Zealand	0.33	0.11	0.13
Norway (9)	0.44	0.19	0.20
Oman	0.30	0.09	0.09
Qatar	0.39	0.15	0.17
Russian Federation	-	-	-
Saudi Arabia	0.34	0.11	0.14
Singapore	0.24	0.06	0.07
Slovenia	-	-	-
South Africa (9)	0.19	0.03	0.05
Sweden	-	-	-
Thailand	0.17	0.03	0.06
Turkey	0.39	0.15	0.16
United Arab Emirates	0.35	0.12	0.15
United States	0.34	0.11	0.13
International Median	0.35	0.12	0.14
Benchmarking Participants			
Buenos Aires, Argentina	0.20	0.04	0.06
Ontario, Canada	0.36	0.13	0.12
Quebec, Canada	0.32	0.10	0.10
Norway (8)	0.35	0.13	0.13
Abu Dhabi, UAE	0.34	0.12	0.14
Dubai, UAE	0.34	0.11	0.12
Florida, US	0.33	0.11	0.13

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

A dash (-) indicates comparable data not available.