

# Students Confident in Biology Scale, Eighth Grade

The Students Confident in Biology (SCB) scale was created based on students' degree of agreement with the eight statements described below.

## Items in the TIMSS 2015 Students Confident in Biology Scale, Eighth Grade

		How much do you agree with these statements about biology?			
		Agree a lot	Agree a little	Disagree a little	Disagree a lot
T	BSBB24A	1) I usually do well in biology ----- ○ ——— ○ ——— ○ ——— ○			
T	BSBB24B*	2) Biology is more difficult for me than for many of my classmates* ----- ○ ——— ○ ——— ○ ——— ○			
T	BSBB24C*	3) Biology is not one of my strengths* ----- ○ ——— ○ ——— ○ ——— ○			
T	BSBB24D	4) I learn things quickly in biology ----- ○ ——— ○ ——— ○ ——— ○			
T	BSBB24E	5) I am good at working out difficult biology problems ----- ○ ——— ○ ——— ○ ——— ○			
T	BSBB24F	6) My teacher tells me I am good at biology ----- ○ ——— ○ ——— ○ ——— ○			
T	BSBB24G*	7) Biology is harder for me than any other subject* ----- ○ ——— ○ ——— ○ ——— ○			
T	BSBB24H*	8) Biology makes me confused* ----- ○ ——— ○ ——— ○ ——— ○			

\* Reverse coded

Very Confident ←————→ Not Confident

11.1                      8.6

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 Biology Scale, Eighth Grade**

Item	delta	tau_1	tau_2	tau_3	Infit
BSBB24A	-0.53880	-1.22367	-0.47664	1.70031	0.92
BSBB24B*	0.02820	-1.04634	-0.25298	1.29932	1.00
BSBB24C*	0.26502	-1.08484	-0.13799	1.22283	0.96
BSBB24D	-0.22053	-1.39570	-0.22015	1.61585	0.91
BSBB24E	0.30089	-1.62811	0.00932	1.61879	1.02
BSBB24F	0.21858	-1.53529	-0.08286	1.61815	1.09
BSBB24G*	0.03479	-0.82612	-0.35591	1.18203	1.01
BSBB24H*	-0.08815	-0.59141	-0.39757	0.98898	1.07

\*Reverse coded

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

Scale Transformation Constants

A = 8.684972

B = 1.447375

Transformed Scale Score = 8.684972 + 1.447375 • Logit Scale Score

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 Biology Scale, Eighth Grade**

Raw Score	Transformed Scale Score	Cutpoint
0	2.85186	
1	4.49062	
2	5.28824	
3	5.84050	
4	6.27693	
5	6.64380	
6	6.97197	
7	7.27080	
8	7.54690	
9	7.81493	
10	8.07299	
11	8.32835	
12	8.58506	8.6
13	8.84688	
14	9.11736	
15	9.40008	
16	9.69874	
17	10.01647	
18	10.36086	
19	10.73954	
20	11.16602	11.1
21	11.66296	
22	12.28106	
23	13.14959	
24	14.86445	

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 Biology Scale, Eighth Grade**

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Component Loadings for Each Item							
			BSBB24A	BSBB24B*	BSBB24C*	BSBB24D	BSBB24E	BSBB24F	BSBB24G*	BSBB24H*
Georgia	0.80	42	0.67	0.63	0.69	0.70	0.65	0.62	0.60	0.62
Hungary	0.88	55	0.80	0.72	0.78	0.80	0.71	0.72	0.73	0.67
Kazakhstan	0.87	52	0.74	0.68	0.73	0.78	0.74	0.72	0.69	0.68
Lebanon	0.75	37	0.66	0.62	0.51	0.71	0.63	0.66	0.62	0.44
Lithuania	0.85	50	0.77	0.68	0.75	0.77	0.74	0.63	0.69	0.60
Malta	0.91	61	0.81	0.76	0.76	0.83	0.79	0.76	0.77	0.76
Morocco	0.67	31	0.66	0.36	0.26	0.74	0.70	0.71	0.38	0.40
Russian Federation	0.87	53	0.74	0.71	0.80	0.80	0.74	0.69	0.69	0.67
Slovenia	0.90	58	0.79	0.73	0.79	0.82	0.76	0.69	0.76	0.73
Sweden	0.87	53	0.77	0.69	0.77	0.79	0.74	0.65	0.70	0.70

\*Reverse coded

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

**Relationship Between the TIMSS 2015 Students Confident in Biology 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 ( $\eta^2$ )
	(r)	(r <sup>2</sup> )	
Georgia	0.36	0.13	0.14
Hungary	0.26	0.07	0.08
Kazakhstan	0.20	0.04	0.04
Lebanon	0.38	0.15	0.14
Lithuania	0.24	0.06	0.06
Malta	0.44	0.20	0.21
Morocco	0.32	0.10	0.09
Russian Federation	0.16	0.02	0.02
Slovenia	0.26	0.07	0.07
Sweden	0.30	0.09	0.09
International Median	0.28	0.08	0.08

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

