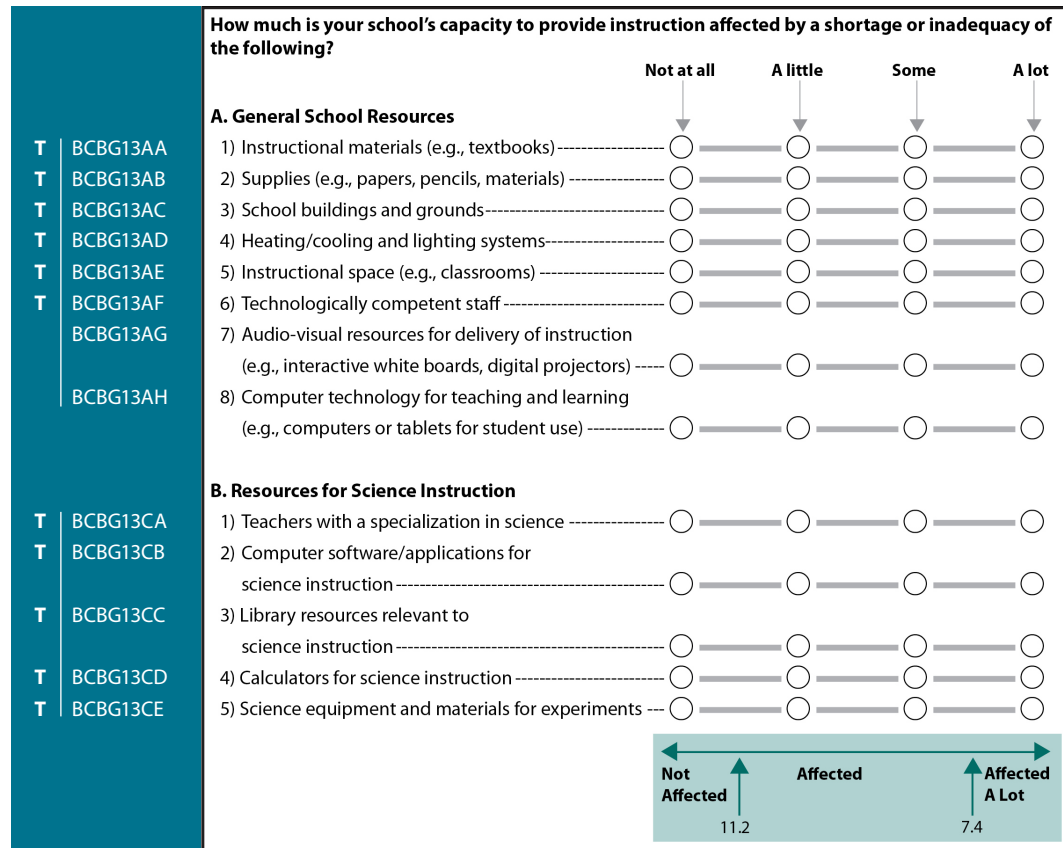


Instruction Affected by Science Resource Shortages—Principals’ Reports Scale, Eighth Grade

The Instruction Affected by Science Resource Shortages—Principals’ Reports (SRS) scale was created based on principals’ responses concerning thirteen school and classroom resources described below.

Items in the TIMSS 2015 Instruction Affected by Science Resource Shortages—Principals’ Reports Scale, Eighth Grade



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 Instruction Affected by Science Resource Shortages - Principals' Reports Scale, Eighth Grade

Item	delta	tau_1	tau_2	tau_3	Infit
BCBG13AA	-0.07780	-0.22995	0.02106	0.20889	0.90
BCBG13AB	-0.41924	-0.35188	0.24401	0.10787	0.95
BCBG13AC	0.09925	-0.82065	0.12894	0.69171	1.01
BCBG13AD	-0.15762	-0.60587	-0.01709	0.62296	0.98
BCBG13AE	0.19292	-0.46731	-0.10673	0.57404	0.97
BCBG13AF	0.04432	-1.24596	-0.05161	1.29757	0.97
BCBG13AG	0.06683	-1.11291	-0.04548	1.15839	1.01
BCBG13AH	0.26152	-1.23259	-0.00701	1.23960	1.07
BCBG13CA	0.05892	0.12619	-0.14295	0.01676	1.07
BCBG13CB	0.17201	-1.33922	-0.06466	1.40388	1.06
BCBG13CC	-0.05514	-1.36034	0.00995	1.35039	1.06
BCBG13CD	-0.56666	-0.75165	0.04489	0.70676	1.40
BCBG13CE	0.38069	-0.81880	-0.11198	0.93078	0.85

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

Scale Transformation Constants for the TIMSS 2015 Instruction Affected by Science Resource Shortages - Principals' Reports Scale, Eighth Grade

Scale Transformation Constants	
A = 9.315269	Transformed Scale Score = 9.315269 + 1.309226 • Logit Scale Score
B = 1.309226	

Equivalence Table of Raw and Transformed Scale Scores for the TIMSS 2015 Instruction Affected by Science Resource Shortages - Principals' Reports Scale, Eighth Grade

Raw Score	Transformed Scale Score	Cutpoint
0	3.88612	
1	5.35335	
2	6.04930	
3	6.51561	
4	6.86952	
5	7.15639	
6	7.39861	7.4
7	7.60979	
8	7.79773	
9	7.96788	
10	8.12416	
11	8.26869	
12	8.40566	
13	8.53569	
14	8.66008	
15	8.77999	
16	8.89646	
17	9.01042	
18	9.12273	
19	9.23419	
20	9.34677	
21	9.45769	
22	9.57129	
23	9.68719	
24	9.80631	
25	9.92960	
26	10.05811	
27	10.19300	
28	10.33482	
29	10.48712	
30	10.65148	
31	10.83088	
32	11.02928	
33	11.25210	11.2
34	11.50748	
35	11.80866	
36	12.17806	
37	12.66071	
38	13.37405	
39	14.85907	

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 Instruction Affected by Science Resource Shortages - Principals' Reports Scale, Eighth Grade

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Component Loadings for Each Item												
			BCBG13AA	BCBG13AB	BCBG13AC	BCBG13AD	BCBG13AE	BCBG13AF	BCBG13AG	BCBG13AH	BCBG13CA	BCBG13CB	BCBG13CC	BCBG13CD	BCBG13CE
Australia	0.92	52	0.74	0.73	0.64	0.61	0.68	0.78	0.77	0.78	0.61	0.74	0.76	0.79	0.74
Bahrain	0.96	68	0.92	0.88	0.85	0.90	0.89	0.87	0.87	0.80	0.85	0.75	0.70	0.50	0.85
Botswana (9)	0.76	31	0.47	0.12	0.50	0.54	0.53	0.29	0.79	0.78	-0.29	0.74	0.72	0.35	0.63
Canada	0.90	47	0.69	0.63	0.58	0.39	0.64	0.73	0.69	0.72	0.70	0.77	0.86	0.67	0.74
Chile	0.91	48	0.63	0.63	0.68	0.60	0.70	0.72	0.75	0.69	0.64	0.71	0.78	0.63	0.78
Chinese Taipei	0.87	40	0.59	0.65	0.64	0.65	0.70	0.65	0.63	0.65	0.53	0.65	0.60	0.52	0.72
Egypt	0.82	34	0.55	0.40	0.71	0.31	0.60	0.66	0.52	0.68	0.62	0.67	0.58	0.44	0.67
England	0.89	47	0.75	0.68	0.71	0.68	0.56	0.63	0.78	0.71	0.56	0.74	0.70	0.60	0.78
Georgia	0.87	41	0.55	0.72	0.68	0.64	0.75	0.69	0.66	0.77	0.64	0.60	0.65	0.30	0.57
Hong Kong SAR	0.94	58	0.81	0.83	0.74	0.84	0.74	0.77	0.75	0.70	0.76	0.69	0.77	0.67	0.81
Hungary	0.89	44	0.65	0.71	0.73	0.71	0.69	0.53	0.70	0.70	0.57	0.65	0.67	0.56	0.68
Iran, Islamic Rep. of	0.89	44	0.74	0.73	0.71	0.76	0.78	0.75	0.63	0.56	0.68	0.61	0.56	0.22	0.69
Ireland	0.89	45	0.66	0.70	0.63	0.64	0.65	0.61	0.79	0.61	0.56	0.77	0.46	0.74	0.79
Israel	0.93	54	0.79	0.82	0.69	0.78	0.68	0.78	0.69	0.60	0.73	0.78	0.75	0.67	0.76
Italy	0.82	34	0.55	-	0.57	0.47	0.55	0.54	0.65	0.66	0.51	0.72	0.66	0.50	0.60
Japan	0.93	55	0.83	0.79	0.81	0.77	0.87	0.64	0.68	0.72	0.81	0.64	0.74	0.53	0.79
Jordan	0.90	45	0.77	0.76	0.81	0.68	0.78	0.71	0.45	0.72	0.75	0.54	0.45	0.30	0.77
Kazakhstan	0.94	57	0.76	0.69	0.67	0.80	0.76	0.82	0.79	0.73	0.80	0.76	0.82	0.56	0.80
Korea, Rep. of	0.94	59	0.76	0.79	0.77	0.80	0.78	0.73	0.73	0.75	0.81	0.80	0.81	0.64	0.80
Kuwait	0.94	57	0.82	0.79	0.77	0.84	0.86	0.76	0.70	0.70	0.86	0.72	0.60	0.51	0.83
Lebanon	0.91	48	0.80	0.84	0.80	0.67	0.82	0.63	0.53	0.33	0.79	0.70	0.49	0.66	0.74
Lithuania	0.89	44	0.64	0.68	0.67	0.67	0.54	0.66	0.70	0.72	0.56	0.77	0.73	0.54	0.69
Malaysia	0.91	50	0.77	0.70	0.78	0.62	0.77	0.70	0.52	0.44	0.80	0.76	0.76	0.67	0.80
Malta	0.90	50	0.79	0.73	0.65	0.66	0.65	0.82	0.76	0.70	0.77	0.48	0.54	0.67	0.85
Morocco	0.69	35	-0.25	-0.09	-0.37	0.32	-0.59	0.69	0.71	0.76	-0.60	0.71	0.81	0.81	0.35
New Zealand	0.89	44	0.73	0.61	0.57	0.67	0.51	0.66	0.62	0.69	0.64	0.69	0.75	0.70	0.72
Norway (9)	0.83	33	0.60	0.50	0.71	0.59	0.60	0.60	0.54	0.49	0.55	0.59	0.58	0.45	0.67
Oman	0.99	60	0.81	0.74	0.68	0.81	0.78	0.81	0.77	0.66	0.81	0.76	0.73	0.49	1.10
Qatar	0.98	79	0.90	0.89	0.88	0.94	0.90	0.93	0.91	0.92	0.93	0.85	0.85	0.73	0.94
Russian Federation	0.88	43	0.64	0.58	0.53	0.69	0.55	0.66	0.71	0.69	0.63	0.76	0.70	0.55	0.76
Saudi Arabia	0.91	50	0.72	0.65	0.73	0.81	0.76	0.68	0.60	0.75	0.76	0.71	0.57	0.64	0.76
Singapore	0.98	80	0.93	0.87	0.87	0.90	0.90	0.86	0.87	0.89	0.91	0.90	0.87	0.91	0.93
Slovenia	0.83	34	0.49	0.59	0.50	0.52	0.56	0.50	0.73	0.74	0.12	0.67	0.69	0.52	0.72
South Africa (9)	0.86	40	0.38	0.18	0.50	0.69	0.48	0.66	0.77	0.75	0.51	0.78	0.73	0.66	0.77
Sweden	0.85	37	0.72	0.67	0.60	0.59	0.53	0.62	0.67	0.64	0.63	0.60	0.35	0.51	0.69
Thailand	0.92	53	0.77	0.79	0.73	0.72	0.73	0.61	0.80	0.71	0.77	0.75	0.57	0.74	0.74
Turkey	0.88	42	0.67	0.63	0.65	0.71	0.71	0.53	0.68	0.62	0.63	0.65	0.61	0.43	0.80
United Arab Emirates	0.97	71	0.87	0.85	0.85	0.88	0.86	0.88	0.84	0.85	0.88	0.78	0.80	0.73	0.89
United States	0.91	50	0.70	0.63	0.65	0.63	0.70	0.69	0.78	0.72	0.69	0.79	0.75	0.65	0.74
Benchmarking Participants															
Buenos Aires, Argentina	0.94	60	0.83	0.82	0.78	0.82	0.79	0.78	0.65	0.72	0.69	0.73	0.85	0.81	0.77
Ontario, Canada	0.88	42	0.62	0.63	0.62	0.26	0.63	0.70	0.66	0.74	0.56	0.72	0.83	0.65	0.70
Quebec, Canada	0.93	54	0.78	0.70	0.71	0.74	0.78	0.64	0.68	0.68	0.81	0.72	0.85	0.69	0.74
Norway (8)	0.84	35	0.63	0.57	0.72	0.61	0.61	0.62	0.58	0.49	0.56	0.56	0.55	0.47	0.68
Abu Dhabi, UAE	0.96	68	0.88	0.84	0.84	0.84	0.85	0.85	0.82	0.78	0.87	0.66	0.80	0.78	0.88
Dubai, UAE	0.98	78	0.91	0.89	0.85	0.91	0.85	0.93	0.88	0.91	0.92	0.88	0.88	0.72	0.94
Florida, US	0.91	49	0.75	0.73	0.75	0.51	0.81	0.66	0.65	0.77	0.52	0.78	0.65	0.61	0.80

A dash (-) indicates comparable data not available.

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

Relationship Between the TIMSS 2015 Instruction Affected by Science Resource Shortages - Principals' Reports 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	0.19	0.04	0.01
Bahrain	0.17	0.03	0.03
Botswana (9)	0.20	0.04	0.05
Canada	0.07	0.01	0.01
Chile	0.18	0.03	0.04
Chinese Taipei	0.15	0.02	0.03
Egypt	-0.12	0.02	0.02
England	0.15	0.02	0.01
Georgia	0.07	0.01	0.01
Hong Kong SAR	0.05	0.00	0.00
Hungary	0.03	0.00	0.00
Iran, Islamic Rep. of	0.13	0.02	0.03
Ireland	0.03	0.00	0.00
Israel	0.28	0.08	0.06
Italy	0.09	0.01	0.00
Japan	0.02	0.00	0.00
Jordan	-0.13	0.02	0.04
Kazakhstan	-0.08	0.01	0.01
Korea, Rep. of	-0.04	0.00	0.00
Kuwait	0.14	0.02	0.07
Lebanon	0.09	0.01	0.05
Lithuania	-0.05	0.00	0.00
Malaysia	-0.16	0.02	0.02
Malta	0.09	0.01	0.01
Morocco	-0.08	0.01	0.02
New Zealand	0.12	0.01	0.01
Norway (9)	0.09	0.01	0.01
Oman	-0.02	0.00	0.00
Qatar	0.15	0.02	0.03
Russian Federation	0.10	0.01	0.00
Saudi Arabia	-0.07	0.00	0.02
Singapore	0.02	0.00	0.00
Slovenia	-0.02	0.00	0.00
South Africa (9)	0.17	0.03	0.07
Sweden	-0.06	0.00	0.00
Thailand	0.11	0.01	0.01
Turkey	0.06	0.00	0.01
United Arab Emirates	0.21	0.04	0.07
United States	0.17	0.03	0.02
International Median	0.09	0.01	0.01
Benchmarking Participants			
Buenos Aires, Argentina	0.30	0.09	0.08
Ontario, Canada	0.02	0.00	0.00
Quebec, Canada	0.12	0.02	0.01
Norway (8)	0.05	0.00	0.00
Abu Dhabi, UAE	0.06	0.00	0.05
Dubai, UAE	0.24	0.06	0.07
Florida, US	-0.01	0.00	0.05

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