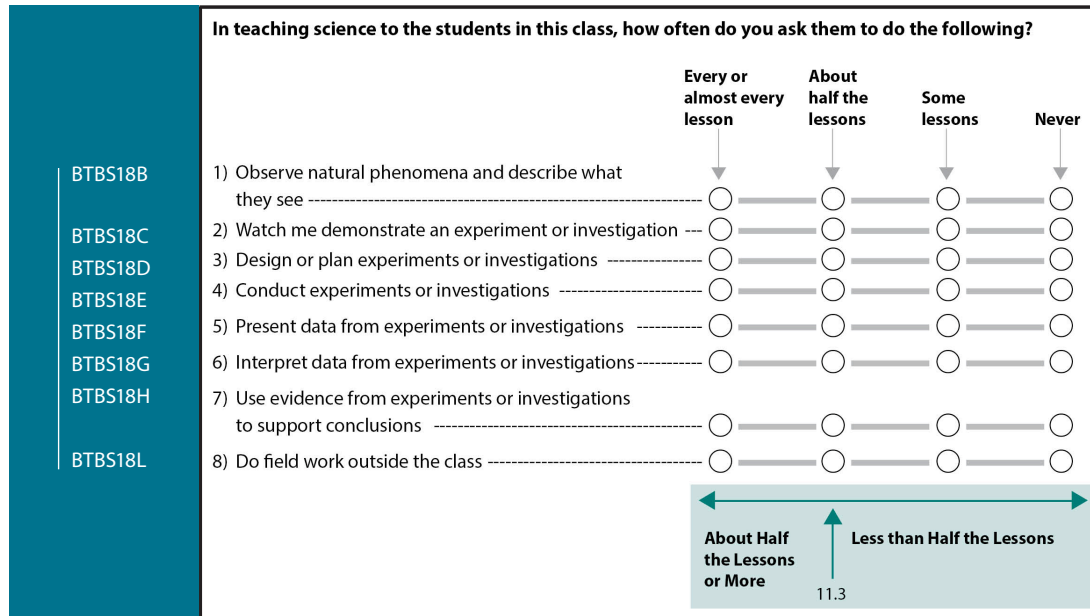


Teachers Emphasize Science Investigation Scale, Eighth Grade

The Teachers Emphasize Science Investigation (ESI) scale was created based on teachers' responses to how often they used the eight instructional activities described below.

Items in the TIMSS 2015 Teachers Emphasize Science Investigation Scale, Eighth Grade¹



¹ For the purpose of scaling, categories in which there were very few respondents were combined. The categories "Some Lessons" and "Never" were combined for all variables. The scale statistics that are reported herein reflect analysis of the items following collapsing.

Item Parameters for the TIMSS 2015 Teachers Emphasize Science Investigation Scale, Eighth Grade

Item	delta	tau_1	tau_2	Infit
BTBS18B	-0.97437	-0.97800	0.97800	1.31
BTBS18C	-0.66109	-0.56569	0.56569	1.35
BTBS18D	0.26321	-0.86969	0.86969	0.88
BTBS18E	-0.08614	-1.06106	1.06106	0.91
BTBS18F	0.14856	-0.94708	0.94708	0.76
BTBS18G	-0.14686	-0.96567	0.96567	0.79
BTBS18H	-0.40814	-0.95404	0.95404	0.98
BTBS18L	1.86483	-0.38627	0.38627	1.30

Scale Transformation Constants for the TIMSS 2015 Teachers Emphasize Science Investigation Scale, Eighth Grade

Scale Transformation Constants

A = 11.333349

B = 1.121755

Transformed Scale Score = 11.333349 + 1.121755 • 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 Teachers Emphasize Science Investigation Scale, Eighth Grade**

Raw Score	Transformed Scale Score	Cutpoint
0	6.89663	
1	8.25918	
2	8.96497	
3	9.47986	
4	9.90541	
5	10.28520	
6	10.63710	
7	10.97567	
8	11.31029	11.3
9	11.65165	
10	12.00438	
11	12.37727	
12	12.77796	
13	13.22328	
14	13.74474	
15	14.43167	
16	15.73375	

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 Teachers Emphasize Science Investigation Scale, Eighth Grade

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Component Loadings for Each Item							
			BTBS18B	BTBS18C	BTBS18D	BTBS18E	BTBS18F	BTBS18G	BTBS18H	BTBS18L
Australia	0.85	49	0.60	0.60	0.76	0.73	0.83	0.84	0.77	0.36
Bahrain	0.89	58	0.59	0.56	0.83	0.86	0.88	0.87	0.83	0.55
Botswana (9)	0.87	54	0.56	0.55	0.78	0.84	0.89	0.88	0.83	0.40
Canada	0.83	48	0.55	0.45	0.74	0.83	0.86	0.84	0.81	0.16
Chile	0.87	53	0.76	0.71	0.75	0.78	0.83	0.77	0.72	0.48
Chinese Taipei	0.88	56	0.57	0.79	0.82	0.82	0.90	0.85	0.77	0.26
Egypt	0.85	51	0.51	0.54	0.80	0.82	0.87	0.82	0.73	0.49
England	0.81	44	0.39	0.45	0.67	0.79	0.87	0.85	0.79	0.13
Georgia	0.82	50	0.45	0.53	0.85	0.87	0.85	0.81	0.61	0.52
Hong Kong SAR	0.84	49	0.55	0.61	0.66	0.74	0.82	0.85	0.88	0.34
Hungary	0.83	48	0.64	0.63	0.73	0.79	0.79	0.75	0.68	0.53
Iran, Islamic Rep. of	0.85	51	0.56	0.48	0.69	0.80	0.86	0.86	0.78	0.59
Ireland	0.82	47	0.39	0.47	0.67	0.75	0.87	0.88	0.82	0.42
Israel	0.85	50	0.64	0.51	0.83	0.78	0.83	0.80	0.68	0.49
Italy	0.88	59	0.47	0.69	0.83	0.86	0.88	0.83	0.87	0.59
Japan	0.79	42	0.63	0.51	0.41	0.75	0.81	0.80	0.76	0.29
Jordan	0.85	50	0.50	0.57	0.77	0.82	0.87	0.83	0.69	0.48
Kazakhstan	0.88	55	0.62	0.66	0.79	0.86	0.81	0.79	0.66	0.67
Korea, Rep. of	0.87	55	0.69	0.69	0.84	0.84	0.87	0.83	0.51	0.58
Kuwait	0.86	52	0.61	0.48	0.83	0.79	0.87	0.86	0.78	0.42
Lebanon	0.82	46	0.56	0.65	0.74	0.82	0.79	0.70	0.57	0.50
Lithuania	0.87	57	0.59	0.63	0.83	0.88	0.88	0.85	0.72	0.55
Malaysia	0.86	53	0.45	0.55	0.72	0.77	0.85	0.87	0.89	0.60
Malta	0.81	49	0.38	0.54	0.71	0.83	0.88	0.89	0.72	0.44
Morocco	0.81	44	0.47	0.42	0.74	0.74	0.84	0.81	0.69	0.36
New Zealand	0.81	45	0.52	0.27	0.64	0.74	0.85	0.84	0.83	0.46
Norway (9)	0.86	51	0.74	0.69	0.74	0.73	0.80	0.78	0.68	0.51
Oman	0.83	47	0.59	0.61	0.71	0.80	0.80	0.79	0.65	0.41
Qatar	0.87	54	0.58	0.64	0.77	0.81	0.83	0.84	0.77	0.56
Russian Federation	0.86	53	0.55	0.61	0.78	0.87	0.86	0.85	0.79	0.39
Saudi Arabia	0.87	53	0.63	0.60	0.80	0.83	0.85	0.81	0.82	0.32
Singapore	0.82	48	0.48	0.66	0.71	0.76	0.83	0.80	0.70	0.48
Slovenia	0.87	56	0.48	0.62	0.81	0.88	0.91	0.89	0.73	0.56
South Africa (9)	0.91	63	0.64	0.75	0.85	0.88	0.86	0.88	0.84	0.58
Sweden	0.84	49	0.46	0.40	0.71	0.85	0.89	0.89	0.85	0.12
Thailand	0.90	59	0.51	0.57	0.84	0.88	0.90	0.89	0.86	0.54
Turkey	0.85	50	0.47	0.54	0.71	0.87	0.83	0.82	0.81	0.48
United Arab Emirates	0.87	54	0.56	0.61	0.78	0.85	0.86	0.85	0.82	0.40
United States	0.89	57	0.64	0.63	0.82	0.83	0.87	0.85	0.79	0.54
Benchmarking Participants										
Buenos Aires, Argentina	0.88	56	0.57	0.75	0.87	0.87	0.81	0.83	0.72	0.50
Ontario, Canada	0.84	49	0.56	0.50	0.74	0.82	0.82	0.83	0.76	0.40
Quebec, Canada	0.82	50	0.52	0.49	0.72	0.83	0.89	0.82	0.89	-0.01
Norway (8)	0.82	46	0.55	0.46	0.79	0.74	0.76	0.77	0.72	0.58
Abu Dhabi, UAE	0.88	57	0.44	0.65	0.83	0.88	0.91	0.87	0.84	0.43
Dubai, UAE	0.85	51	0.63	0.65	0.66	0.79	0.85	0.87	0.81	0.31
Florida, US	0.88	54	0.62	0.66	0.79	0.81	0.79	0.87	0.78	0.50

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

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

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