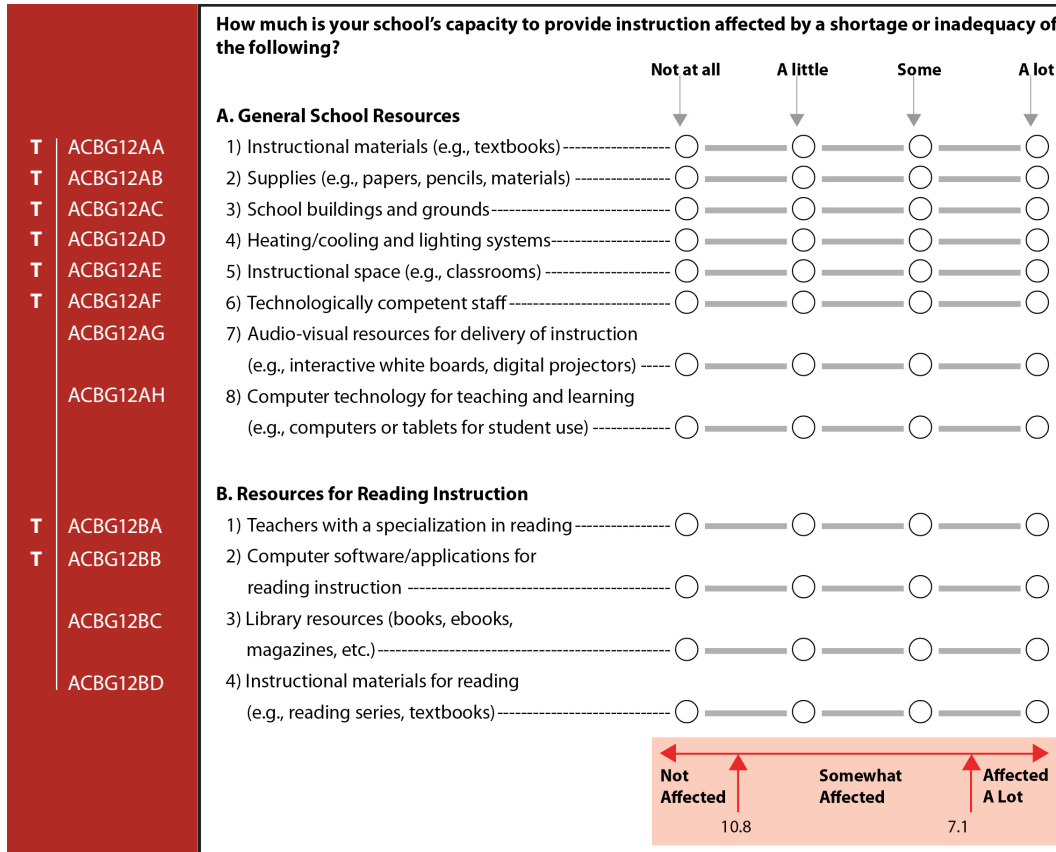


# Instruction Affected by Reading Resource Shortages Scale

The *Instruction Affected by Reading Resource Shortages* (RRS) scale was created based on principals' responses concerning 12 school and classroom resources described below.

## Items in the PIRLS 2016 *Instruction Affected by Reading Resource Shortages* Scale



T Trend item—item was included in the same scale in PIRLS 2011 and was used for linking the PIRLS 2011 and PIRLS 2016 scales.

**Item Parameters for the PIRLS 2016 Instruction Affected by Reading Resource Shortages Scale**

Item	delta	tau_1	tau_2	tau_3	Infit
ACBG12AA	-0.24046	-0.50371	0.08908	0.41463	0.82
ACBG12AB	-0.61342	-0.65578	0.29517	0.36061	0.80
ACBG12AC	0.08419	-0.83453	0.08039	0.75414	0.99
ACBG12AD	-0.24529	-0.51694	0.09957	0.41737	0.89
ACBG12AE	0.10860	-0.60282	-0.03207	0.63489	0.96
ACBG12AF	0.21641	-1.33100	-0.06590	1.39690	0.93
ACBG12AG	0.13549	-1.21210	0.19877	1.01333	1.01
ACBG12AH	0.42199	-1.38470	0.07125	1.31345	1.11
ACBG12BA	-0.06206	-0.90262	-0.08571	0.98833	1.16
ACBG12BB	0.31635	-1.64938	-0.05748	1.70686	1.28
ACBG12BC	0.03715	-1.42224	0.02144	1.40080	0.92
ACBG12BD	-0.15895	-1.09436	0.07055	1.02381	0.75

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

**Scale Transformation Constants for the PIRLS 2016 Instruction Affected by Reading Resource Shortages Scale**

Scale Transformation Constants	
A = 8.945066	Transformed Scale Score = 8.945066 + 1.274387 • Logit Scale Score
B = 1.274387	

**Equivalence Table of the Raw Score and Transformed Scale Scores for the PIRLS  
2016 Instruction Affected by Reading Resource Shortages Scale**

Raw Score	Transformed Scale Score	Cutpoint
0	3.54611	
1	4.98767	
2	5.67829	
3	6.14581	
4	6.50349	
5	6.79540	
6	7.04460	7.1
7	7.26319	
8	7.45917	
9	7.63803	
10	7.80296	
11	7.95892	
12	8.10685	
13	8.24846	
14	8.38527	
15	8.51855	
16	8.64954	
17	8.77923	
18	8.90734	
19	9.03876	
20	9.17049	
21	9.30484	
22	9.44284	
23	9.58565	
24	9.73450	
25	9.89005	
26	10.05541	
27	10.23239	
28	10.42394	
29	10.63402	
30	10.86810	10.8
31	11.13383	
32	11.44471	
33	11.82273	
34	12.31260	
35	13.02750	
36	14.49613	

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

**Cronbach's Alpha Reliability Coefficient and Principal Components Analysis of the Items in the PIRLS 2016 Instruction Affected by Reading Resource Shortages Scale**

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Component Loadings for Each Item											
			ACBG12AA	ACBG12AB	ACBG12AC	ACBG12AD	ACBG12AE	ACBG12AF	ACBG12AG	ACBG12AH	ACBG12BA	ACBG12BB	ACBG12BC	ACBG12BD
Australia	0.93	57	0.76	0.77	0.76	0.69	0.69	0.73	0.78	0.75	0.71	0.75	0.81	0.84
Austria	0.80	33	0.45	0.44	0.64	0.33	0.62	0.48	0.66	0.69	0.32	0.69	0.66	0.67
Azerbaijan	0.91	50	0.71	0.71	0.72	0.77	0.75	0.70	0.56	0.68	0.69	0.64	0.74	0.77
Bahrain	0.96	70	0.89	0.88	0.83	0.89	0.91	0.81	0.86	0.77	0.76	0.67	0.88	0.89
Belgium (Flemish)	0.81	34	0.66	0.55	0.53	0.55	0.57	0.59	0.63	0.63	0.49	0.53	0.60	0.66
Belgium (French)	0.79	31	0.60	0.57	0.49	0.63	0.46	0.63	0.63	0.50	0.52	0.61	0.51	0.55
Bulgaria	0.82	43	0.85	0.74	0.68	0.88	0.77	0.44	0.39	0.35	0.83	-0.04	0.43	0.87
Canada	0.90	49	0.71	0.73	0.64	0.58	0.61	0.71	0.76	0.73	0.62	0.69	0.78	0.78
Chile	0.91	51	0.77	0.80	0.69	0.53	0.74	0.69	0.70	0.76	0.62	0.55	0.81	0.83
Chinese Taipei	0.94	60	0.78	0.73	0.80	0.88	0.82	0.85	0.85	0.79	0.59	0.47	0.79	0.85
Czech Republic	0.78	31	0.72	0.54	0.52	0.56	0.54	0.51	0.52	0.61	0.57	0.50	0.33	0.70
Denmark	0.85	40	0.66	0.58	0.66	0.59	0.52	0.51	0.66	0.54	0.59	0.69	0.68	0.79
Egypt	0.87	41	0.57	0.72	0.73	0.61	0.69	0.56	0.53	0.52	0.67	0.62	0.66	0.75
England	0.87	43	0.69	0.68	0.68	0.54	0.59	0.61	0.80	0.75	0.38	0.58	0.65	0.78
Finland	0.88	44	0.77	0.72	0.66	0.66	0.73	0.64	0.65	0.64	0.58	0.61	0.53	0.69
France	0.79	31	0.68	0.64	0.58	0.57	0.49	0.42	0.44	0.52	0.43	0.56	0.62	0.69
Georgia	0.88	45	0.69	0.78	0.68	0.72	0.70	0.59	0.51	0.76	0.61	0.57	0.66	0.69
Germany	0.88	43	0.70	0.70	0.62	0.45	0.61	0.67	0.65	0.65	0.61	0.69	0.71	0.73
Hong Kong SAR	0.85	38	0.54	0.51	0.74	0.67	0.80	0.72	0.67	0.58	0.53	0.38	0.55	0.62
Hungary	0.88	44	0.76	0.71	0.70	0.73	0.73	0.47	0.71	0.56	0.58	0.49	0.68	0.74
Iran, Islamic Rep. of	0.89	46	0.70	0.80	0.79	0.85	0.85	0.69	0.58	0.43	0.75	0.42	0.37	0.70
Ireland	0.85	39	0.73	0.72	0.51	0.52	0.46	0.63	0.59	0.56	0.63	0.54	0.73	0.77
Israel	0.95	64	0.87	0.85	0.79	0.87	0.73	0.86	0.69	0.66	0.84	0.72	0.79	0.87
Italy	0.85	39	0.53	0.64	0.64	0.52	0.61	0.65	0.61	0.65	0.51	0.57	0.74	0.74
Kazakhstan	0.95	65	0.85	0.76	0.81	0.89	0.84	0.85	0.68	0.65	0.84	0.77	0.86	0.87
Kuwait	0.91	51	0.81	0.81	0.59	0.82	0.80	0.76	0.65	0.67	0.58	0.50	0.70	0.77
Latvia	0.94	62	0.90	0.86	0.83	0.80	0.85	0.87	0.73	0.66	0.81	0.28	0.80	0.88
Lithuania	0.88	43	0.72	0.67	0.51	0.65	0.54	0.68	0.73	0.66	0.65	0.57	0.65	0.79
Macao SAR	0.90	51	0.80	0.69	0.69	0.79	0.78	0.85	0.76	0.81	0.14	0.00	0.87	0.74
Malta	0.92	54	0.88	0.87	0.63	0.51	0.69	0.68	0.87	0.75	0.55	0.62	0.80	0.86
Morocco	0.84	40	0.35	0.51	0.42	0.71	0.29	0.77	0.75	0.76	0.68	0.78	0.77	0.49
Netherlands	0.77	29	0.42	0.24	0.53	0.46	0.42	0.50	0.54	0.48	0.53	0.69	0.69	0.78
New Zealand	0.88	46	0.73	0.61	0.59	0.63	0.51	0.72	0.65	0.73	0.64	0.72	0.74	0.79
Northern Ireland	0.90	48	0.75	0.78	0.71	0.73	0.69	0.59	0.78	0.73	0.51	0.59	0.65	0.77
Norway (5)	0.86	40	0.67	0.62	0.62	0.62	0.67	0.62	0.63	0.58	0.57	0.71	0.59	0.64
Oman	0.94	60	0.83	0.78	0.76	0.82	0.85	0.84	0.73	0.71	0.79	0.59	0.70	0.82
Poland	0.85	40	0.68	0.71	0.60	0.57	0.66	0.56	0.65	0.73	0.61	0.43	0.65	0.67
Portugal	0.90	50	0.75	0.74	0.74	0.71	0.73	0.67	0.63	0.62	0.59	0.73	0.75	0.77
Qatar	0.98	81	0.92	0.91	0.90	0.92	0.91	0.94	0.94	0.91	0.90	0.76	0.83	0.93
Russian Federation	0.91	53	0.77	0.76	0.58	0.81	0.67	0.73	0.70	0.69	0.68	0.67	0.81	0.79
Saudi Arabia	0.86	41	0.60	-	0.69	0.68	0.72	0.77	0.58	0.59	0.72	0.58	0.43	0.66
Singapore	0.96	71	0.92	0.85	0.85	0.89	0.86	0.78	0.89	0.89	0.59	0.71	0.87	0.91
Slovak Republic	0.85	38	0.64	0.74	0.58	0.61	0.58	0.59	0.71	0.64	0.56	0.57	0.49	0.69
Slovenia	0.83	37	0.66	0.62	0.40	0.44	0.47	0.38	0.76	0.70	0.66	0.59	0.72	0.72
South Africa	0.81	38	-0.15	-0.30	0.29	0.58	0.16	0.64	0.86	0.88	0.75	0.86	0.77	0.39
Spain	0.90	48	0.73	0.73	0.69	0.72	0.79	0.65	0.72	0.65	0.58	0.48	0.69	0.80
Sweden	0.86	41	0.72	0.62	0.56	0.51	0.56	0.66	0.68	0.62	0.60	0.74	0.63	0.74
Trinidad and Tobago	0.86	39	0.54	0.43	0.67	0.65	0.64	0.52	0.59	0.60	0.67	0.65	0.73	0.75
United Arab Emirates	0.96	71	0.87	0.87	0.85	0.90	0.87	0.89	0.86	0.81	0.82	0.62	0.86	0.87
United States	0.93	56	0.80	0.82	0.80	0.76	0.74	0.74	0.73	0.67	0.58	0.70	0.81	0.82
<b>Benchmarking Participants</b>														
Buenos Aires, Argentina	0.90	48	0.71	0.63	0.71	0.68	0.78	0.71	0.65	0.66	0.60	0.70	0.68	0.78
Ontario, Canada	0.92	54	0.69	0.74	0.65	0.59	0.64	0.76	0.81	0.75	0.68	0.76	0.85	0.84
Quebec, Canada	0.91	51	0.81	0.81	0.68	0.63	0.76	0.64	0.63	0.70	0.64	0.70	0.87	0.77
Denmark (3)	0.84	37	0.64	0.52	0.67	0.55	0.49	0.52	0.64	0.55	0.56	0.64	0.66	0.76
Norway (4)	0.85	40	0.67	0.61	0.64	0.60	0.68	0.63	0.61	0.58	0.59	0.70	0.60	0.63
Moscow City, Russian Fed.	0.94	62	0.85	0.78	0.70	0.87	0.83	0.80	0.71	0.73	0.77	0.60	0.85	0.90
Eng/Afr/Zulu - RSA (5)	0.83	36	0.13	0.08	0.41	0.65	0.35	0.65	0.76	0.73	0.80	0.79	0.70	0.59
Andalusia, Spain	0.83	35	0.56	0.56	0.61	0.66	0.70	0.51	0.70	0.56	0.47	0.52	0.58	0.67
Madrid, Spain	0.88	45	0.70	0.71	0.63	0.62	0.60	0.70	0.69	0.71	0.60	0.65	0.69	0.71
Abu Dhabi, UAE	0.96	67	0.85	0.84	0.82	0.87	0.86	0.88	0.84	0.79	0.79	0.53	0.86	0.83
Dubai, UAE	0.98	78	0.90	0.90	0.88	0.91	0.86	0.89	0.92	0.87	0.85	0.78	0.90	0.93

A dash (-) indicates comparable data not available.

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

**Relationship Between the PIRLS 2016 *Instruction Affected by Reading Resource Shortages* Scale and PIRLS 2016 Reading Achievement**

Country	Pearson's Correlation with Reading Achievement		Variance in Reading Achievement Accounted for by Difference Between Regions of the Scale ( $\eta^2$ )
	(r)	(r <sup>2</sup> )	
Australia	0.13	0.02	0.02
Austria	0.04	0.00	0.01
Azerbaijan	-0.13	0.02	0.02
Bahrain	0.13	0.02	0.02
Belgium (Flemish)	-0.01	0.00	0.00
Belgium (French)	0.06	0.00	0.00
Bulgaria	0.15	0.02	0.02
Canada	0.00	0.00	0.00
Chile	0.12	0.01	0.02
Chinese Taipei	0.07	0.01	0.00
Czech Republic	-0.01	0.00	0.00
Denmark	0.06	0.00	0.00
Egypt	0.12	0.01	0.01
England	0.05	0.00	0.00
Finland	0.04	0.00	0.00
France	0.08	0.01	0.00
Georgia	0.11	0.01	0.01
Germany	0.12	0.01	0.02
Hong Kong SAR	0.11	0.01	0.01
Hungary	-0.01	0.00	0.00
Iran, Islamic Rep. of	0.11	0.01	0.02
Ireland	0.05	0.00	0.00
Israel	0.29	0.08	0.07
Italy	0.01	0.00	0.00
Kazakhstan	0.04	0.00	0.01
Kuwait	0.03	0.00	0.01
Latvia	-0.02	0.00	0.00
Lithuania	0.05	0.00	0.00
Macao SAR	-0.13	0.02	0.01
Malta	0.06	0.00	0.00
Morocco	-0.07	0.01	0.01
Netherlands	0.04	0.00	0.00
New Zealand	0.13	0.02	0.01
Northern Ireland	-0.01	0.00	0.00
Norway (5)	0.09	0.01	0.01
Oman	0.07	0.00	0.01
Poland	0.05	0.00	0.00
Portugal	0.15	0.02	0.01
Qatar	0.24	0.06	0.05
Russian Federation	0.09	0.01	0.00
Saudi Arabia	-0.13	0.02	0.01
Singapore	-0.06	0.00	0.01
Slovak Republic	0.01	0.00	0.00
Slovenia	0.03	0.00	0.00
South Africa	0.19	0.04	0.03
Spain	0.18	0.03	0.05
Sweden	0.13	0.02	0.02
Trinidad and Tobago	0.11	0.01	0.00
United Arab Emirates	0.28	0.08	0.09
United States	-0.04	0.00	0.02
<b>International Median</b>	<b>0.06</b>	<b>0.01</b>	<b>0.01</b>
<b>Benchmarking Participants</b>			
Buenos Aires, Argentina	0.19	0.03	0.03
Ontario, Canada	-0.02	0.00	0.00
Quebec, Canada	0.03	0.00	0.00
Denmark (3)	0.01	0.00	0.00
Norway (4)	0.09	0.01	0.00
Moscow City, Russian Fed.	-0.01	0.00	0.00
Eng/Afr/Zulu - RSA (5)	0.21	0.05	0.07
Andalusia, Spain	0.13	0.02	0.01
Madrid, Spain	0.08	0.01	0.01
Abu Dhabi, UAE	0.28	0.08	0.08
Dubai, UAE	0.23	0.05	0.05

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016