

# Appendix 15B: TIMSS Advanced 2015 Context Questionnaire Scales, Physics

## Home Educational Resources Scale, Physics

The Home Educational Resources (HER) scale was created based on students' responses concerning the availability of four resources described below.

### Items in the TIMSS Advanced 2015 Home Educational Resources Scale, Physics

PSBG04	<p><b>Number of books in the home:</b></p> <p>1) 0-10</p> <p>2) 11-25</p> <p>3) 26-100</p> <p>4) 101-200</p> <p>5) More than 200</p>	<p><b>Highest level of education of either parent:</b></p> <p>1) Finished some primary or lower secondary or did not go to school</p> <p>2) Finished lower secondary</p> <p>3) Finished upper secondary</p> <p>4) Finished post-secondary education</p> <p>5) Finished university or higher</p>	PSDGEDUP <sup>1</sup>
PSDG06S <sup>1</sup>	<p><b>Number of home study supports:</b></p> <p>1) None</p> <p>2) Study desk/table or own room</p> <p>3) Both</p>		
PSDGOCCP <sup>1</sup>	<p><b>Highest level of occupation of either parent:</b></p> <p>1) Has never worked outside home for pay, general laborer, or semi-professional (skilled agricultural or fishery worker, craft or trade worker, plant or machine operator)</p> <p>2) Clerical (clerk or service or sales worker)</p> <p>3) Small business owner</p> <p>4) Professional (corporate manager or senior official, professional, or technician or associate professional)</p>		

<sup>1</sup> Derived variable. For more details, see Supplement 3 of the TIMSS Advanced 2015 User Guide for the [International Database](#).

**Item Parameters for the TIMSS Advanced 2015 Home Educational Resources Scale, Physics**

Item	delta	tau_1	tau_2	tau_3	tau_4	Infit
PSBG04	0.64929	-0.89914	-0.53587	0.86039	0.57462	1.09
PSDG06S	-0.90816	-0.25972	0.25972			1.11
PSDGEDUP	-0.11749	-0.59426	-0.48752	0.88533	0.19645	1.01
PSDGOCCP	0.37636	-0.64586	1.24705	-0.60119		0.99

**Scale Transformation Constants for the TIMSS Advanced 2015 Home Educational Resources Scale, Physics**

Scale Transformation Constants

A = 7.525439

B = 2.234962

Transformed Scale Score = 7.525439 + 2.234962 • Logit Scale Score

**Equivalence Table of the Raw Score and the Transformed Scale Score for the TIMSS Advanced 2015 Home Educational Resources Scale, Physics**

Raw Score	Transformed Scale Score	Cutpoint
0	1.31964	
1	3.68097	
2	4.88859	
3	5.77587	5.8
4	6.50614	
5	7.14369	
6	7.71485	
7	8.25370	
8	8.77829	
9	9.31522	
10	9.89707	
11	10.57858	
12	11.48758	11.4
13	13.18946	

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

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 Advanced 2015 Home Educational Resources Scale, Physics**

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Component Loadings for Each Item			
			PSB604	PSD606S	PSD6EDJP	PSD60CCP
France	0.60	47	0.65	0.31	0.84	0.81
Italy	0.59	46	0.66	0.22	0.84	0.81
Lebanon	0.51	40	0.60	0.40	0.73	0.75
Norway	0.51	43	0.67	0.28	0.79	0.75
Portugal	0.67	51	0.75	0.08	0.87	0.84
Russian Federation	0.41	38	0.60	0.17	0.78	0.74
Slovenia	0.55	44	0.67	0.14	0.83	0.77
Sweden	0.58	46	0.70	0.42	0.76	0.77
United States	0.52	43	0.73	0.50	0.81	0.51
International Avg.	0.55	44	0.67	0.28	0.80	0.75

**Relationship Between the TIMSS Advanced 2015 Home Educational Resources Scale, and TIMSS Advanced 2015 Physics Achievement**

Country	Pearson's Correlation with Physics Achievement		Variance in Physics Achievement Accounted for by Difference Between Regions of the Scale ( $\eta^2$ )
	(r)	(r <sup>2</sup> )	
France	0.33	0.11	0.07
Italy	0.14	0.02	0.01
Lebanon	0.19	0.04	0.02
Norway	0.26	0.07	0.05
Portugal	0.31	0.09	0.07
Russian Federation	0.15	0.02	0.01
Slovenia	0.21	0.04	0.04
Sweden	0.36	0.13	0.10
United States	0.32	0.10	0.08
International Median	0.26	0.07	0.05

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