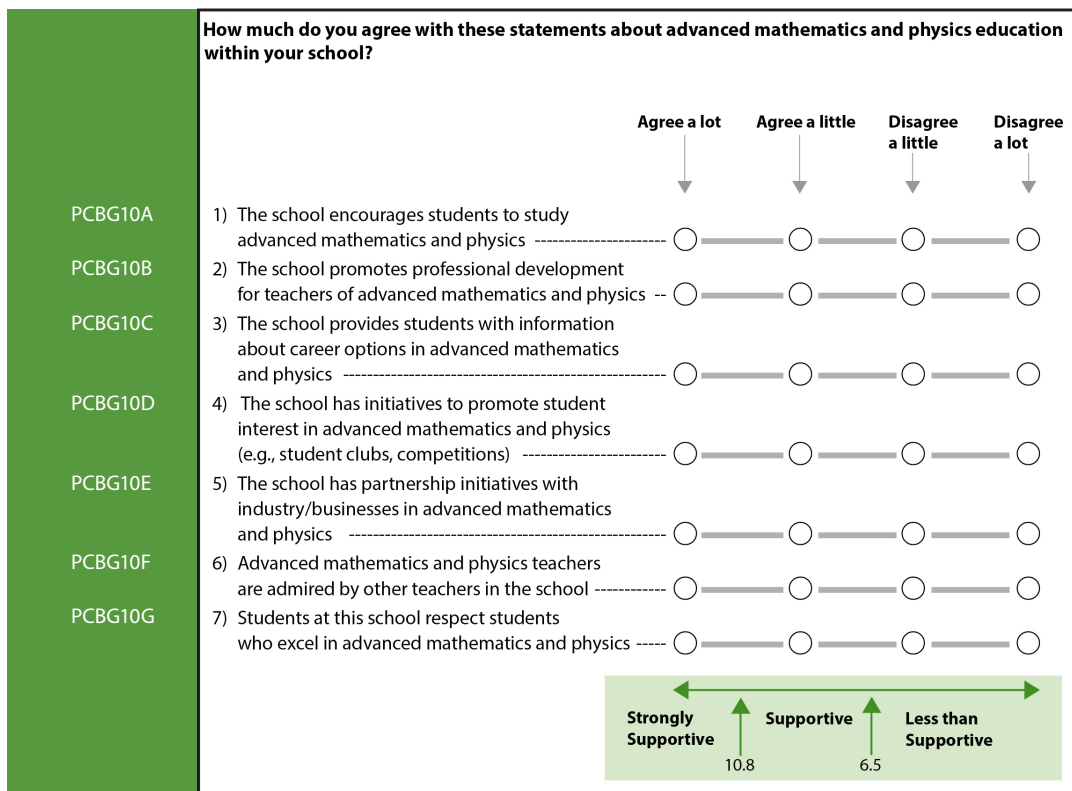


# School Supports Advanced Mathematics and Physics Education—Principal Version Scale, Physics

The School Supports Advanced Mathematics and Physics Education—Principal Version (SMP) scale was created based on principals’ responses characterizing the seven aspects described below.

## Items in the TIMSS Advanced 2015 School Supports Advanced Mathematics and Physics Education—Principal Version Scale, Physics<sup>1</sup>



<sup>1</sup> For the purpose of scaling, categories in which there were very few respondents were combined. The categories “Disagree a little” and “Disagree a lot” were combined for all variables. The scale statistics that are reported herein reflect analysis of the items following collapsing.

**Item Parameters for the TIMSS Advanced 2015 School Supports Advanced Mathematics and Physics Education - Principal Version Scale, Physics**

Item	delta	tau_1	tau_2	Infit
PCBG10A	-0.96174	-1.03132	1.03132	0.84
PCBG10B	-0.48986	-1.17668	1.17668	0.91
PCBG10C	-0.82638	-1.18249	1.18249	0.91
PCBG10D	-0.45940	-0.92144	0.92144	0.92
PCBG10E	1.76069	-0.59088	0.59088	1.05
PCBG10F	1.04013	-0.61623	0.61623	1.03
PCBG10G	-0.06344	-0.95292	0.95292	1.08

**Scale Transformation Constants for the TIMSS Advanced 2015 School Supports Advanced Mathematics and Physics Education - Principal Version Scale, Physics**

Scale Transformation Constants

$$A = 8.69507$$

$$B = 1.384086$$

$$\text{Transformed Scale Score} = 8.69507 + 1.384086 \cdot \text{Logit Scale Score}$$

**Equivalence Table of the Raw Score and the Transformed Scale Score for the TIMSS Advanced 2015 School Supports Advanced Mathematics and Physics Education - Principal Version Scale, Physics**

Raw Score	Transformed Scale Score	Cutpoint
0	3.03255	
1	4.78821	
2	5.74762	
3	6.48485	6.5
4	7.12106	
5	7.70041	
6	8.24387	
7	8.76353	
8	9.27161	
9	9.78476	
10	10.31709	
11	10.89611	10.8
12	11.57031	
13	12.46547	
14	14.14715	

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 School Supports Advanced Mathematics and Physics Education - Principal Version Scale, Physics**

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Component Loadings for Each Item							
			PCBG10A	PCBG10B	PCBG10C	PCBG10D	PCBG10E	PCBG10F	PCBG10G	
France	0.66	34	0.70	0.60	0.62	0.56	0.50	0.60	0.46	
Italy	0.77	42	0.81	0.71	0.75	0.61	0.66	0.47	0.46	
Lebanon	0.75	41	0.61	0.65	0.74	0.76	0.56	0.60	0.57	
Norway	0.70	37	0.65	0.47	0.47	0.70	0.56	0.69	0.67	
Portugal	0.76	41	0.53	0.68	0.62	0.65	0.58	0.73	0.67	
Russian Federation	0.67	40	0.57	0.73	0.70	0.63	0.36	0.62	0.73	
Slovenia	0.73	39	0.60	0.70	0.66	0.71	0.72	0.47	0.45	
Sweden	0.73	40	0.76	0.79	0.78	0.75	0.44	0.21	0.40	
United States	0.80	47	0.64	0.69	0.74	0.78	0.50	0.69	0.73	
International Avg.	0.73	40	0.65	0.67	0.68	0.68	0.54	0.56	0.57	

**Relationship Between the TIMSS Advanced 2015 School Supports Advanced Mathematics and Physics Education - Principal Version 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	0.03	0.00	0.00
Italy	0.05	0.00	0.01
Lebanon	0.04	0.00	0.01
Norway	0.07	0.01	0.00
Portugal	-0.02	0.00	0.00
Russian Federation	0.19	0.04	0.06
Slovenia	0.25	0.06	0.04
Sweden	0.14	0.02	0.02
United States	0.01	0.00	0.00
International Median	0.05	0.00	0.01

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