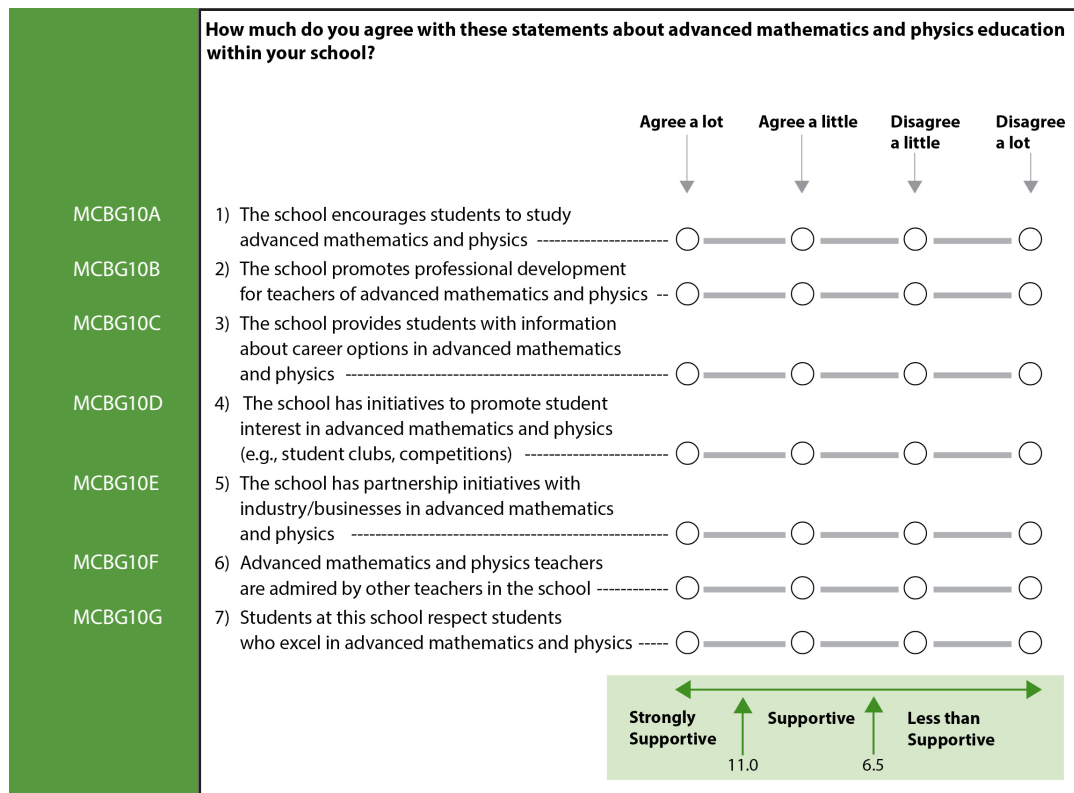


School Supports Advanced Mathematics and Physics Education—Principal Version Scale, Advanced Mathematics

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, Advanced Mathematics¹



¹ 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, Advanced Mathematics

Item	delta	tau_1	tau_2	Infit
MCBG10A	-0.97501	-1.02632	1.02632	0.90
MCBG10B	-0.49096	-1.21322	1.21322	0.96
MCBG10C	-0.81296	-1.29416	1.29416	0.94
MCBG10D	-0.54344	-1.00501	1.00501	0.95
MCBG10E	1.78310	-0.57696	0.57696	1.06
MCBG10F	1.03554	-0.58860	0.58860	0.94
MCBG10G	0.00373	-0.96389	0.96389	0.97

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

Scale Transformation Constants

$$A = 8.749167$$

$$B = 1.410095$$

$$\text{Transformed Scale Score} = 8.749167 + 1.410095 \cdot \text{Logit Scale Score}$$

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, Advanced Mathematics

Raw Score	Transformed Scale Score	Cutpoint
0	2.89865	
1	4.69620	
2	5.68613	
3	6.45357	6.5
4	7.12107	
5	7.73084	
6	8.30187	
7	8.84425	
8	9.36982	
9	9.89666	
10	10.43956	
11	11.02451	11.0
12	11.71058	
13	12.61631	
14	14.32251	

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, Advanced Mathematics

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Component Loadings for Each Item							
			MCBGT0A	MCBGT0B	MCBGT0C	MCBGT0D	MCBGT0E	MCBGT0F	MCBGT0G	
France	0.66	34	0.70	0.60	0.62	0.56	0.50	0.60	0.46	
Italy	0.73	40	0.81	0.73	0.68	0.60	0.67	0.31	0.46	
Lebanon	0.75	41	0.61	0.64	0.73	0.76	0.56	0.60	0.56	
Norway	0.65	35	0.34	0.56	0.70	0.49	0.40	0.79	0.73	
Portugal	0.73	39	0.55	0.66	0.58	0.69	0.49	0.69	0.66	
Russian Federation	0.72	40	0.55	0.58	0.58	0.71	0.55	0.77	0.66	
Russian Federation 6hr+	0.69	41	0.71	0.78	0.65	0.65	0.52	0.62	0.53	
Slovenia	0.69	36	0.62	0.64	0.63	0.64	0.63	0.51	0.49	
Sweden	0.71	37	0.78	0.60	0.62	0.58	0.60	0.52	0.51	
United States	0.78	44	0.57	0.63	0.71	0.77	0.60	0.67	0.70	
International Avg.	0.71	38	0.62	0.63	0.65	0.64	0.56	0.61	0.58	

Relationship Between the TIMSS Advanced 2015 School Supports Advanced Mathematics and Physics Education - Principal Version Scale, and TIMSS Advanced 2015 Advanced Mathematics Achievement

Country	Pearson's Correlation with Advanced Mathematics Achievement		Variance in Advanced Mathematics Achievement Accounted for by Difference Between Regions of the Scale (η^2)
	(r)	(r ²)	
France	0.02	0.00	0.00
Italy	0.06	0.00	0.00
Lebanon	0.10	0.01	0.00
Norway	0.17	0.03	0.05
Portugal	0.03	0.00	0.01
Russian Federation	0.16	0.03	0.01
Russian Federation 6hr+	0.21	0.04	0.02
Slovenia	0.29	0.09	0.04
Sweden	0.06	0.00	0.00
United States	0.10	0.01	0.01
International Median	0.10	0.01	0.01

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