

Effective Teaching Strategies and Assessment for Student Learning Recovery Post Covid-19

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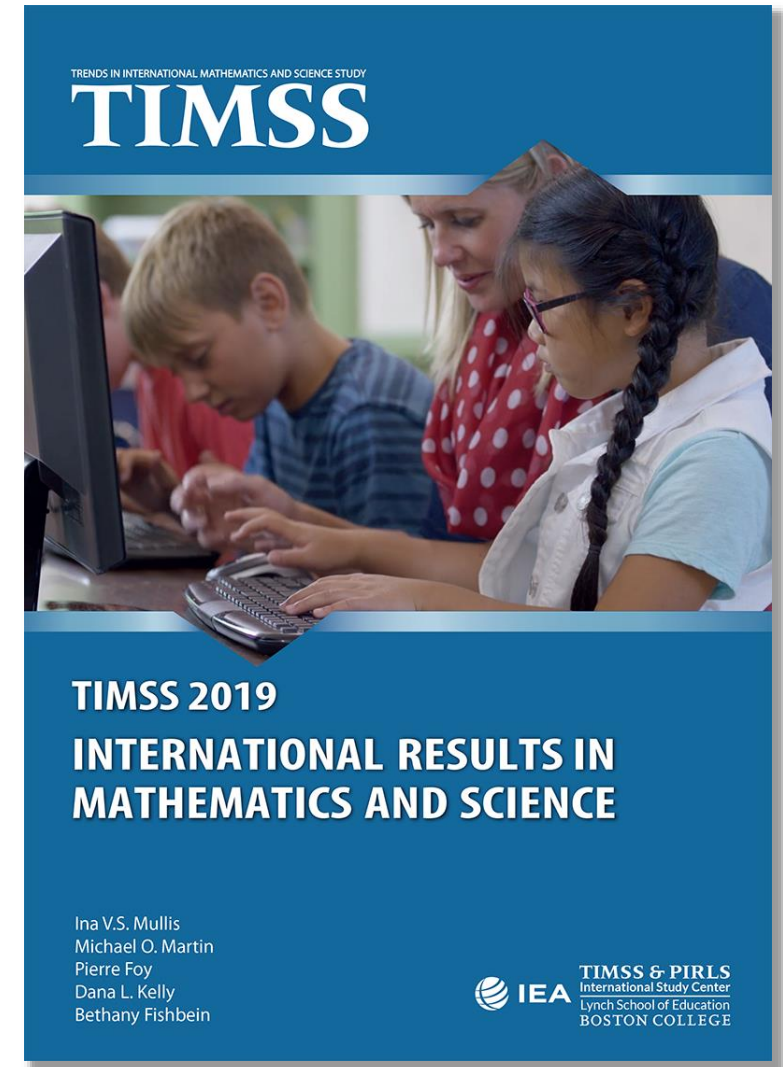
2023 International Conference on Educational Measurement and Evaluation
Manila, The Philippines

International Achievement in Mathematics and Science

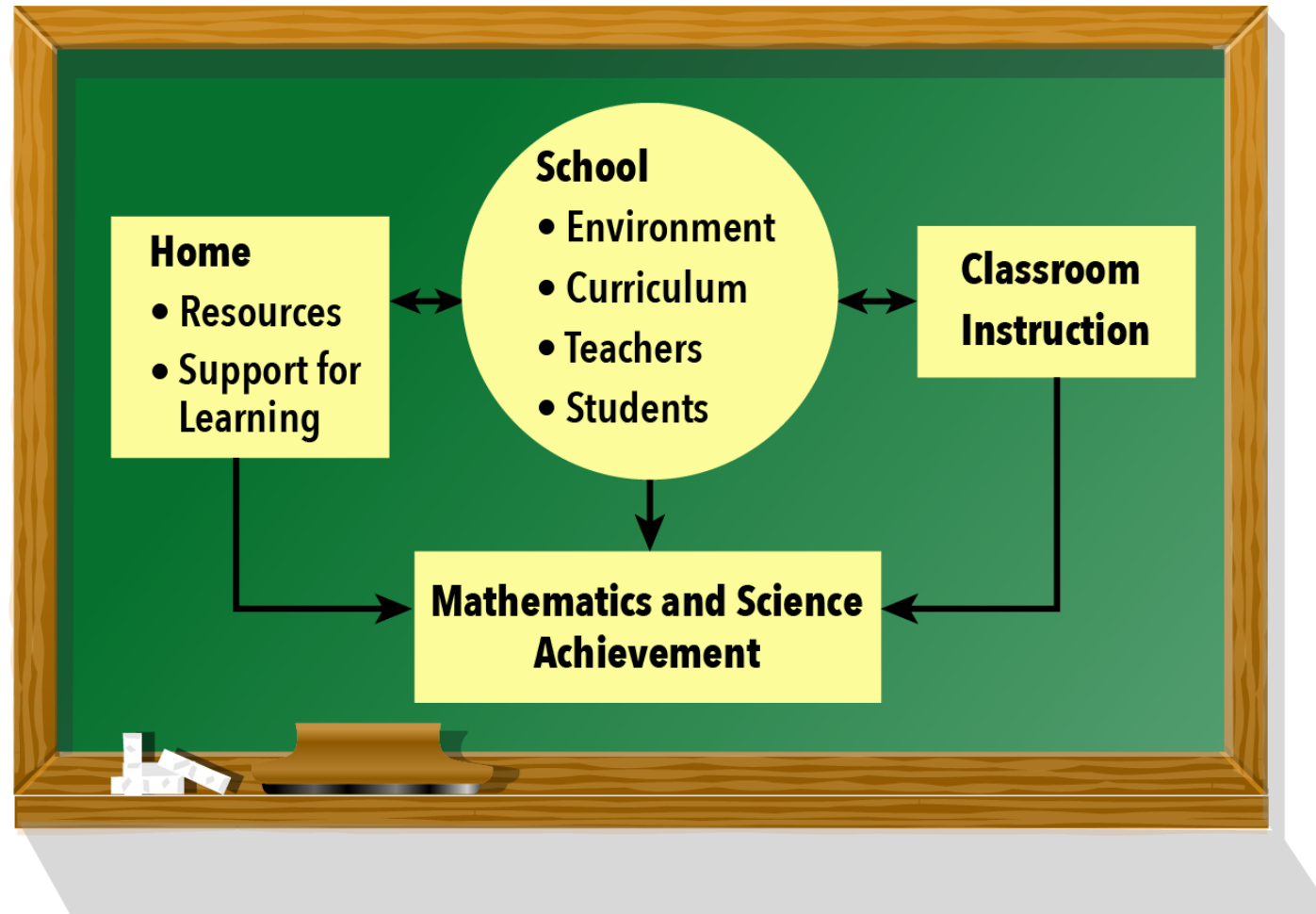
Fourth Grade

- 58 countries
- More than 330,000 students

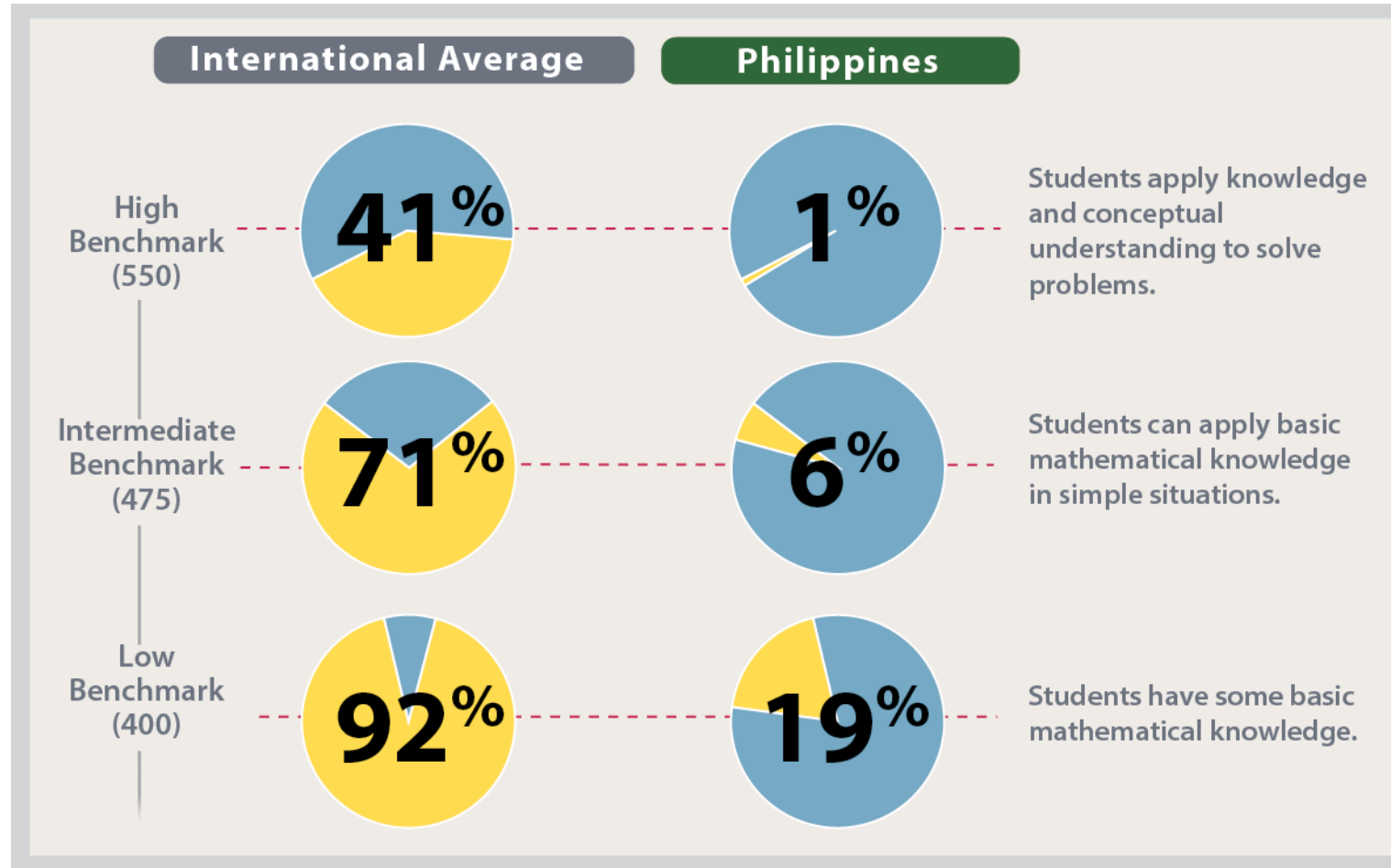
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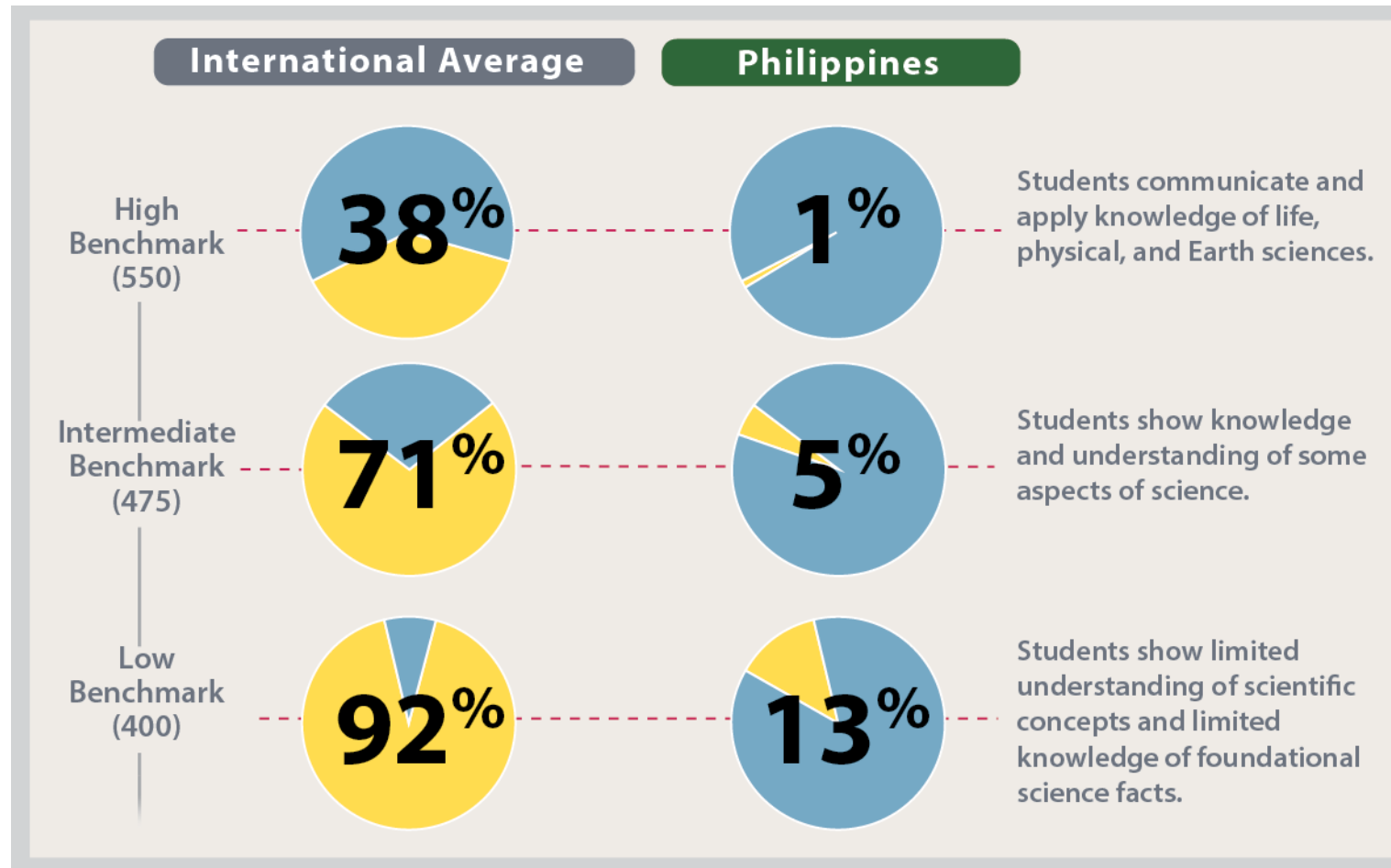
TIMSS (Trends in International Mathematics & Science Study) Contexts for Teaching and Learning



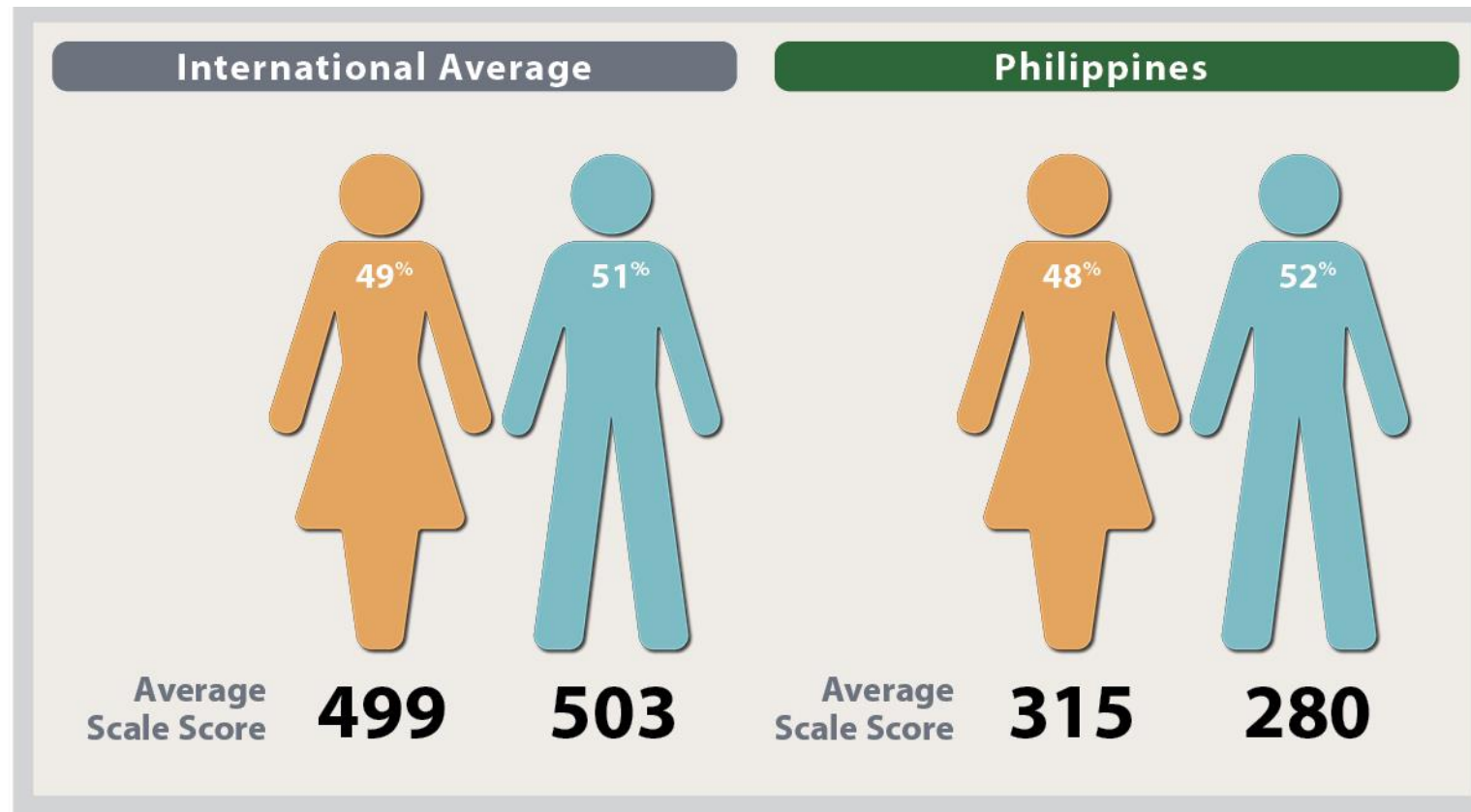
Achievement at TIMSS International Benchmarks – Mathematics – Fourth Grade



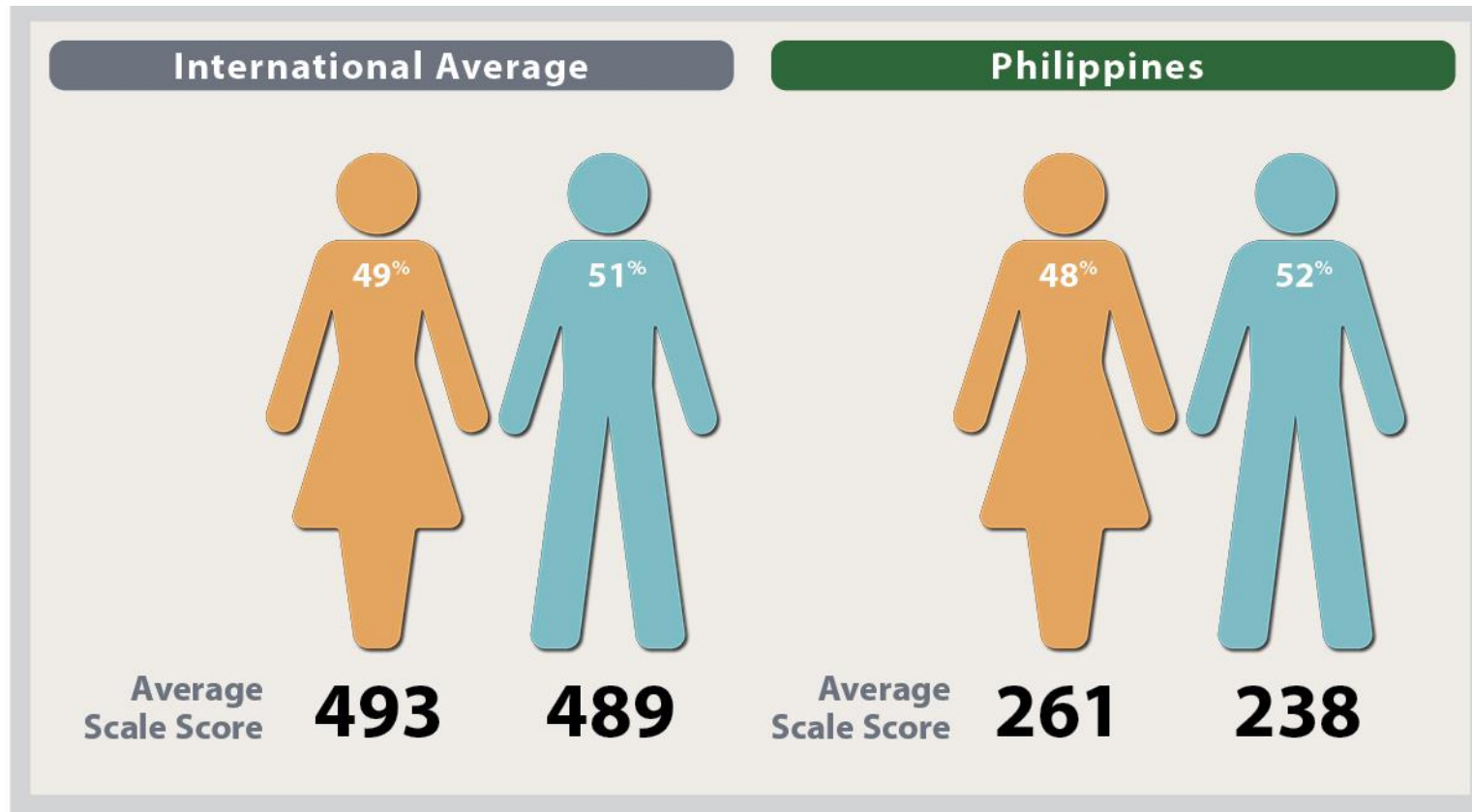
Achievement at TIMSS International Benchmarks – Science – Fourth Grade



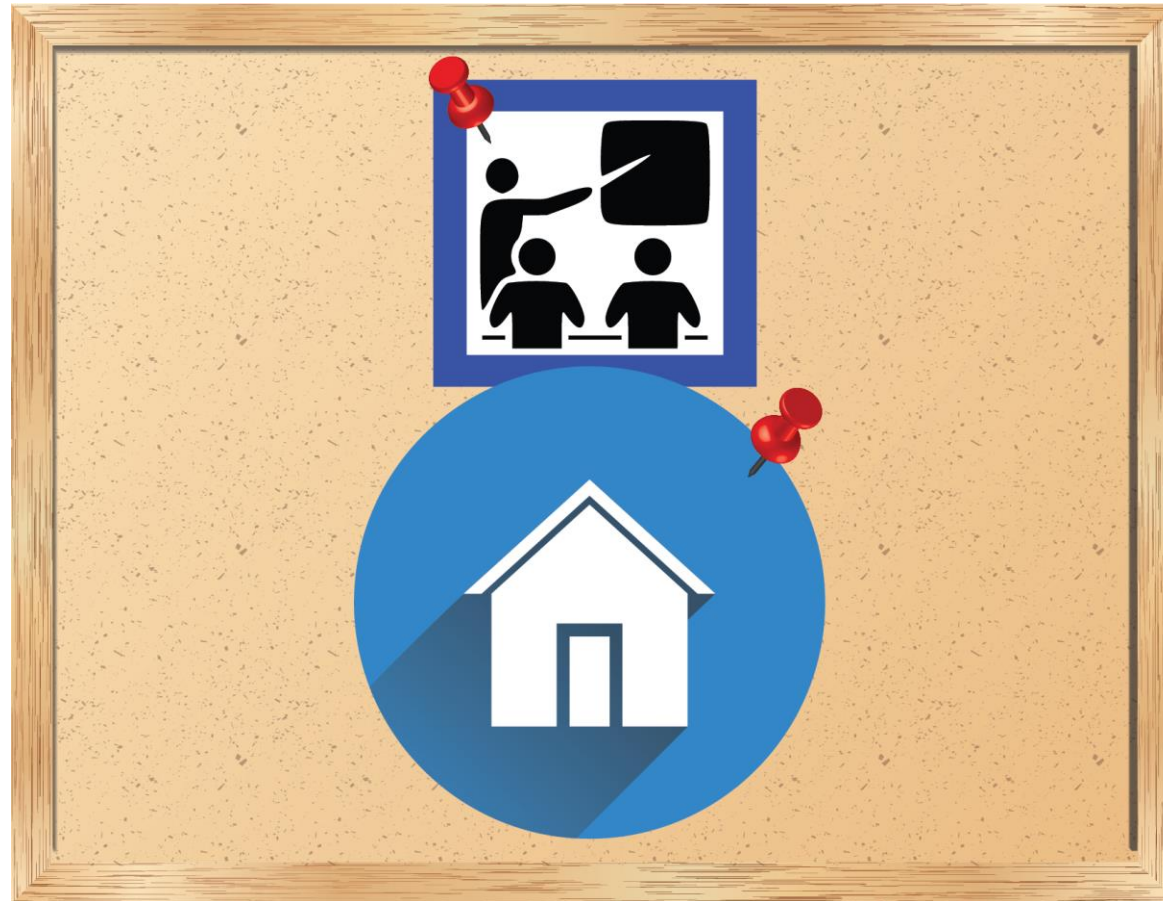
Gender Differences in Average Achievement Mathematics – Fourth Grade



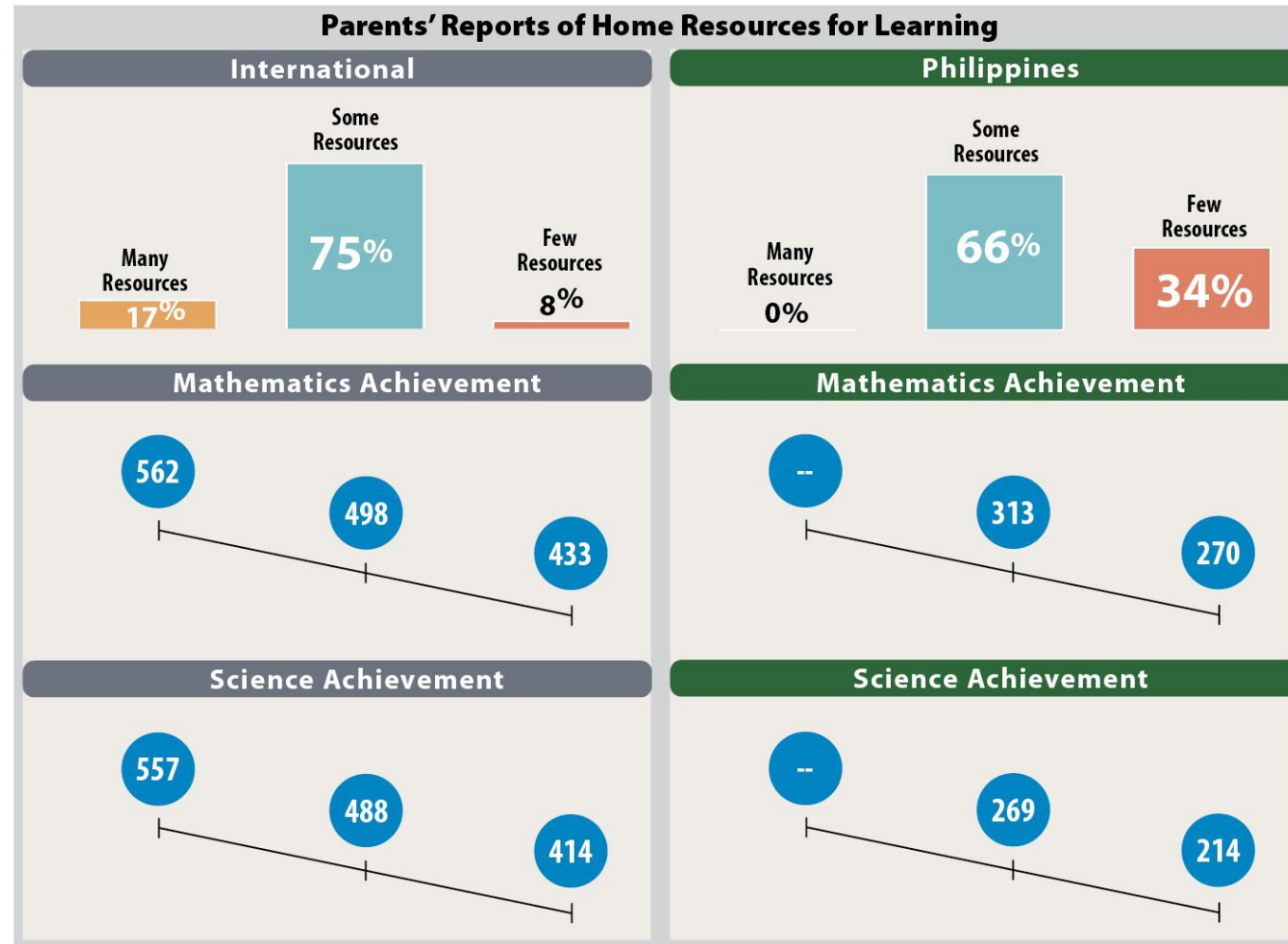
Gender Differences in Average Achievement Science – Fourth Grade



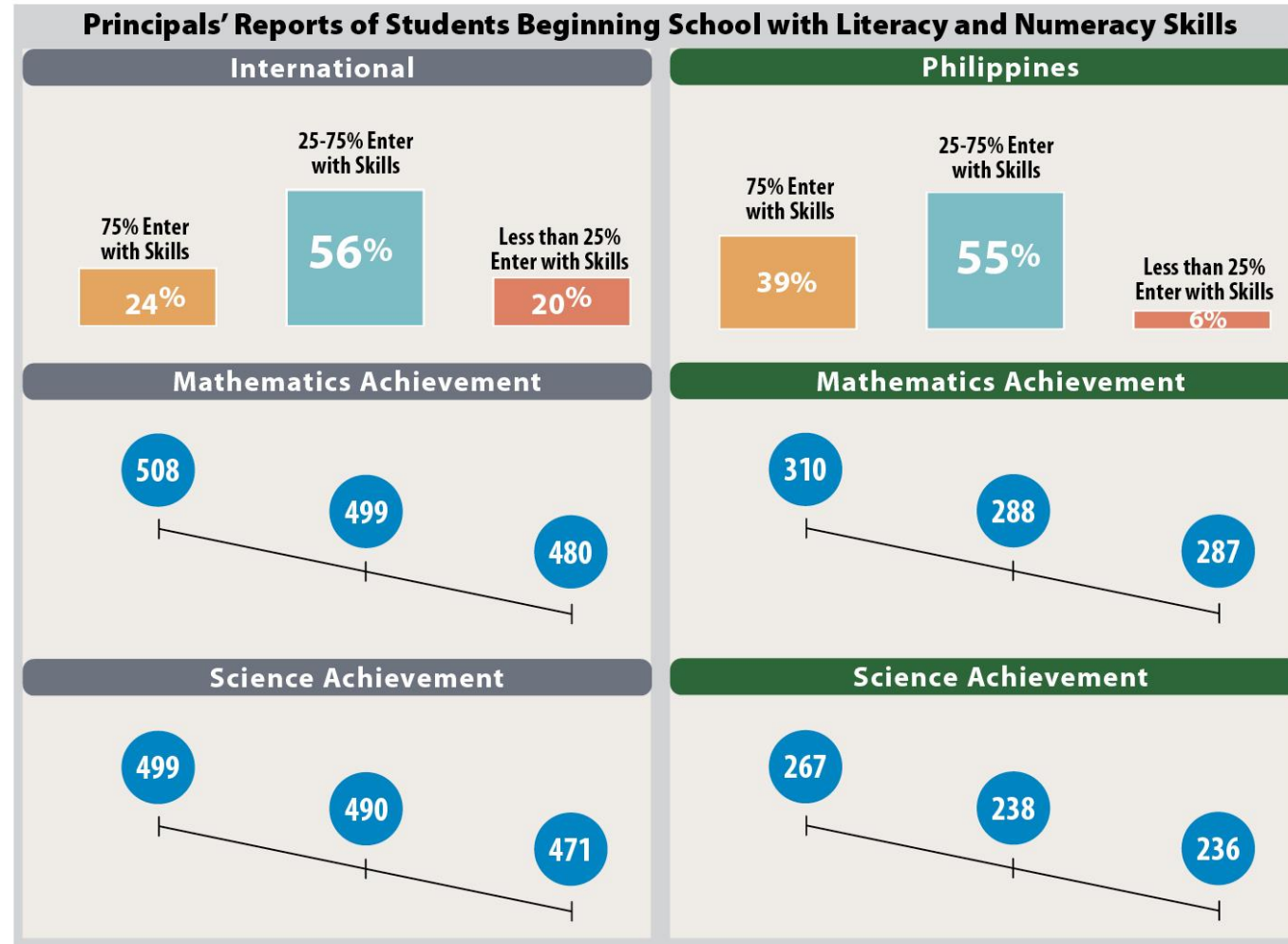
Home Support for Learning



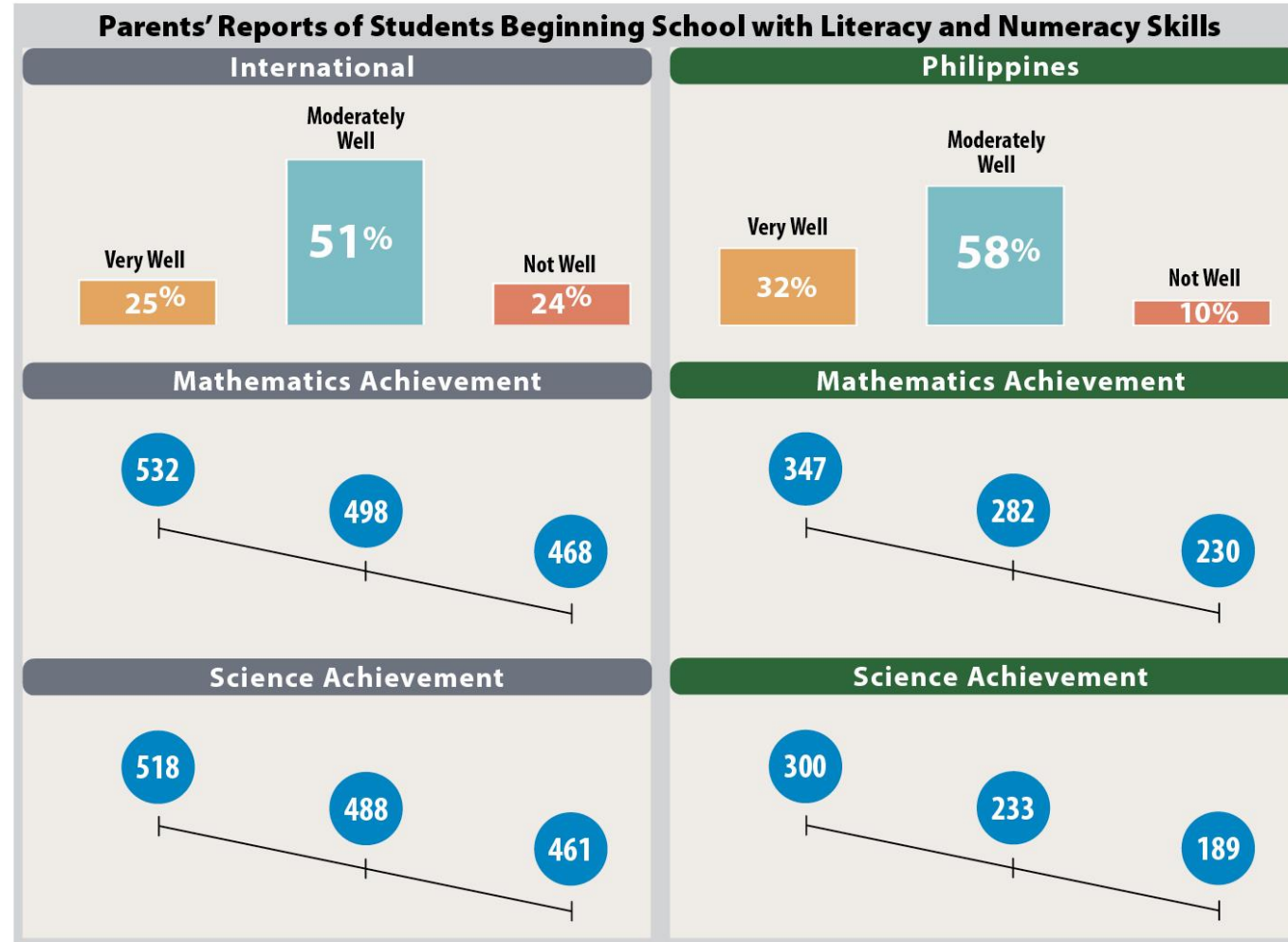
Home Resources for Learning



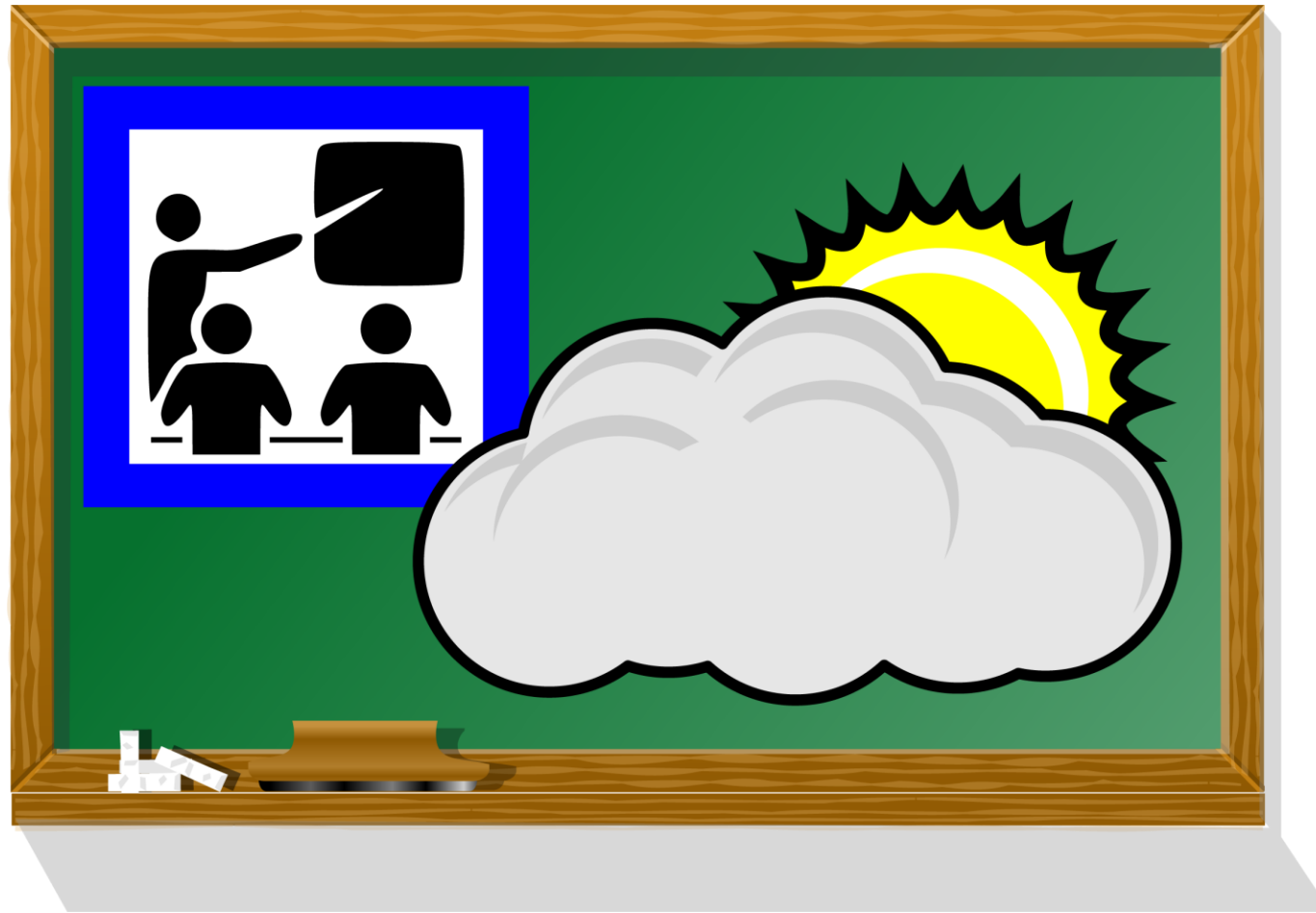
Percentages of Fourth Grade Students Entering the Primary Grades with Literacy and Numeracy Skills



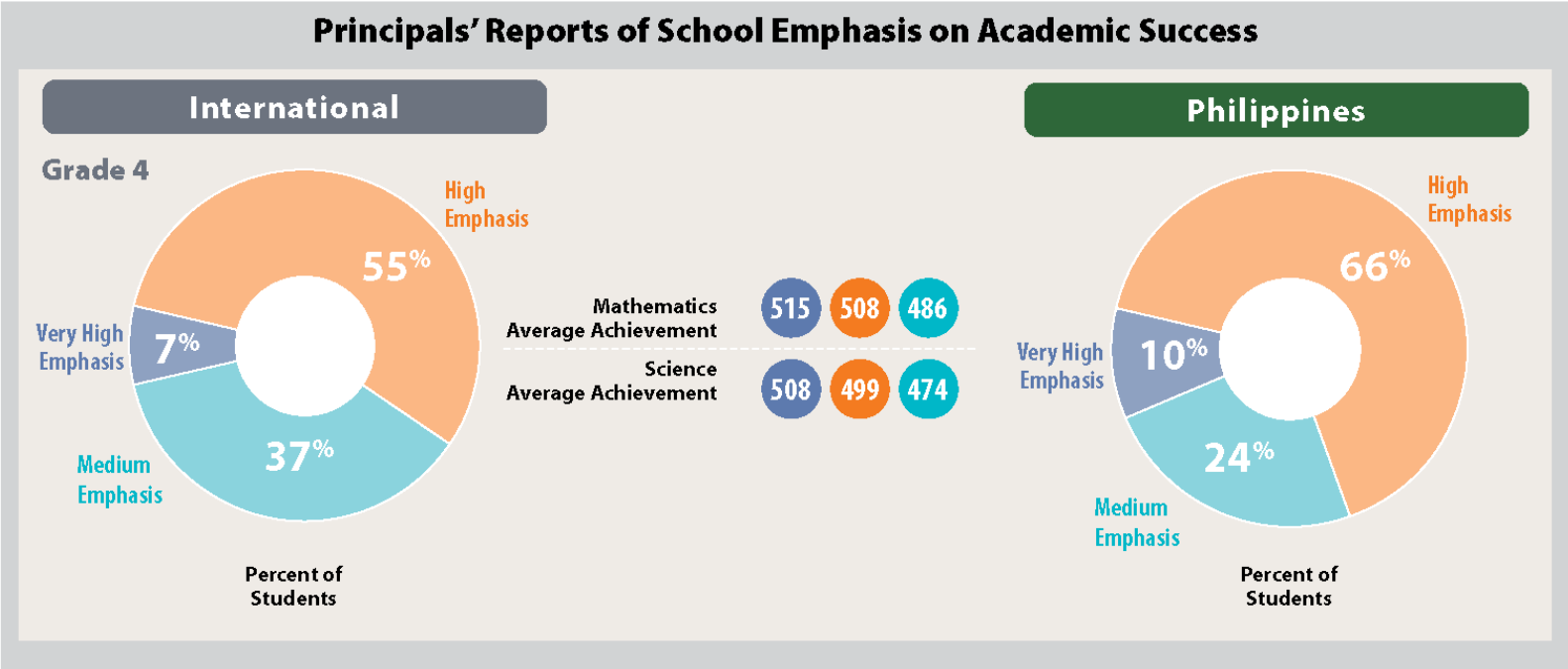
Fourth Grade Students Begin School with Literacy and Numeracy Skills



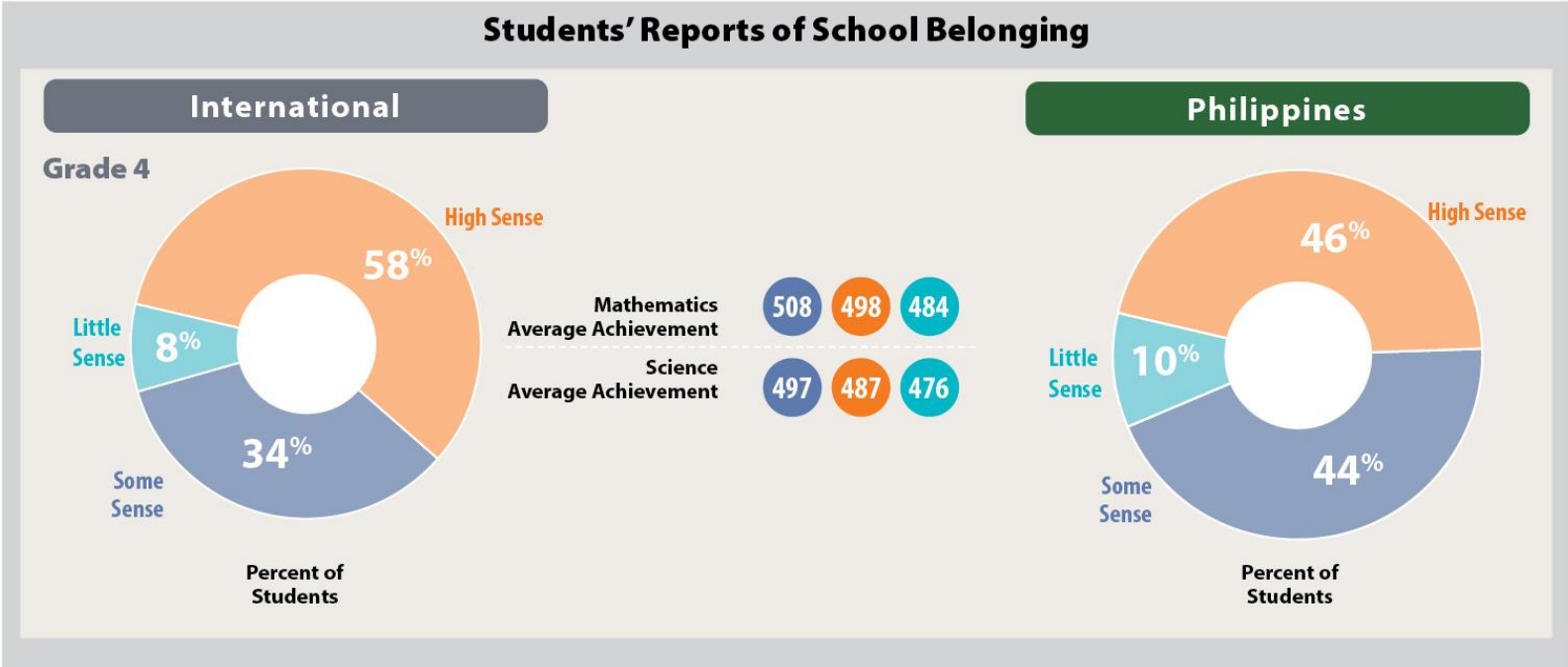
Schools' Instructional Climate



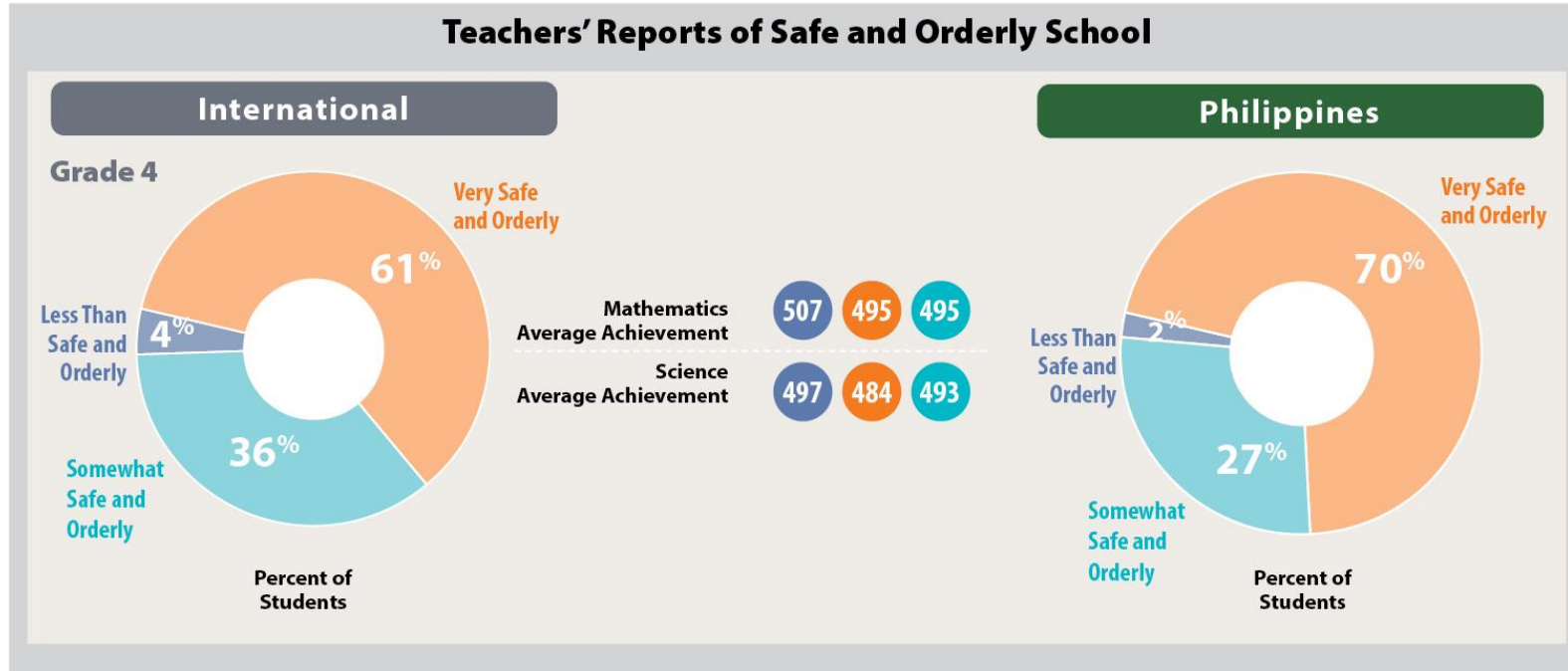
School Emphasis on Academic Success



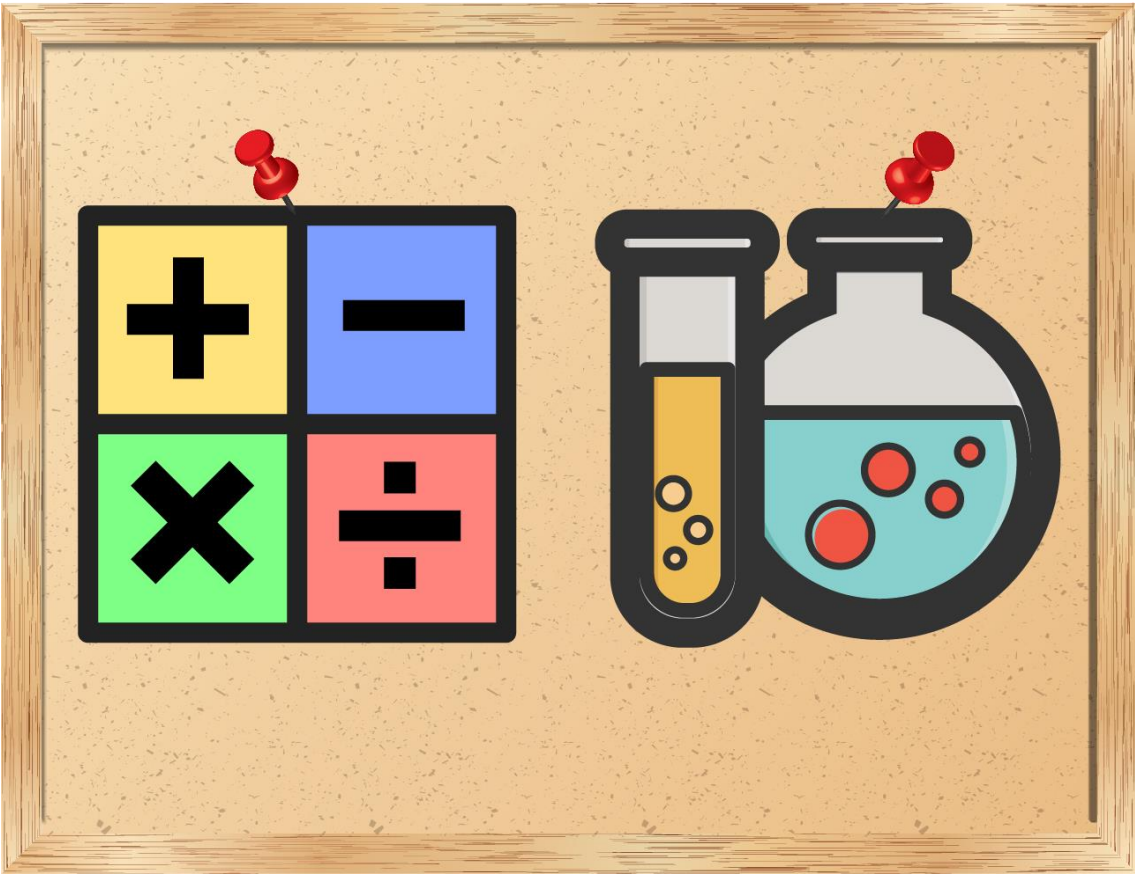
Students' Sense of School Belonging



Safe and Orderly School



Mathematics and Science Curriculum



Instructional Time Spent on Mathematics & Science

Principals' and Teachers' Reports of Instructional Time Spent on Mathematics and Science

	Total Instructional Hours Per Year	Mathematics Instructional Hours Per Year	Science Instructional Hours Per Year
Fourth Grade			
International Average	895	154	73
Philippines	1225	173	158

TIMSS Mathematics Content Areas

TIMSS Mathematics Content Areas	Percent Coverage in Assessment
Number	50%
Whole Number (+, -, x, ÷)	25%
Pre-algebra	15%
Fractions and Decimals	10%
Measurement and Geometry	30%
Fractions and Decimals	10%

TIMSS Science Content Areas

TIMSS Science Content Areas	Percent Coverage in Assessment
Life Science	45%
Characteristics of living things	
Physical Science	35%
Properties of matter, energy, forces	
Earth Science	20%
Characteristics of Earth, solar system	

TIMSS Cognitive Domains: Mathematics and Science

TIMSS Cognitive Domains: Mathematics and Science	Percent Coverage in Assessment
Knowledge	40%
Facts, concepts, procedures	
Applying	40%
Operations/compare, relate, explain	
Reasoning	20%
Analyze, synthesize, generalize	

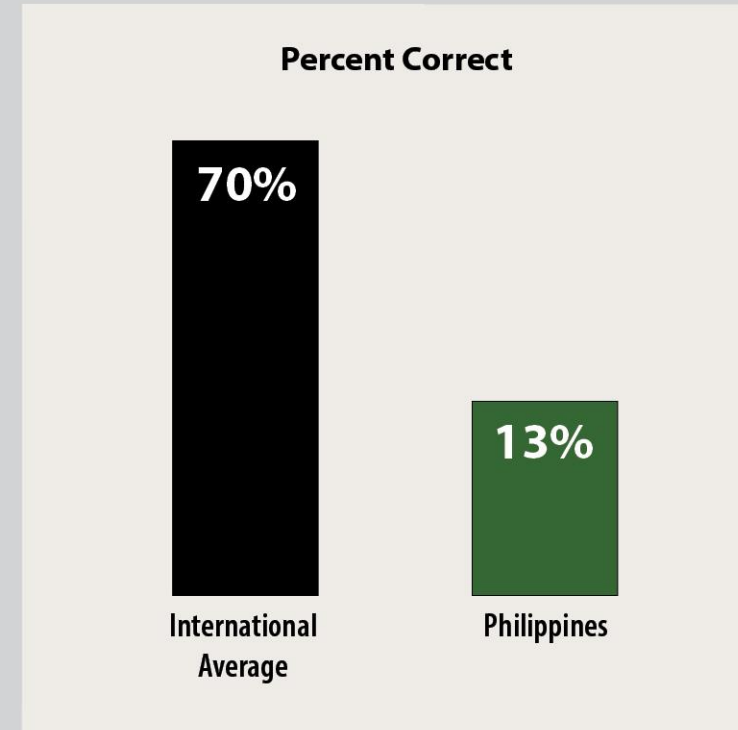
Mathematics Intermediate Benchmark

Mathematics TIMSS Topic – Fourth Grade – Example Measurement and Geometry, Applying

Format: Constructed-response

Complete this figure so the dashed line is a line of symmetry.
Click squares on the grid.

The answer shown illustrates the type of response that would receive full credit (1 point).



Science Intermediate Benchmark

Science TIMSS Topic – Fourth Grade – Example Physical Science, Applying

Format: Multiple-choice

Tina and Mary need to move identical heavy boxes. Tina has to pull harder on her box to move it than Mary does.



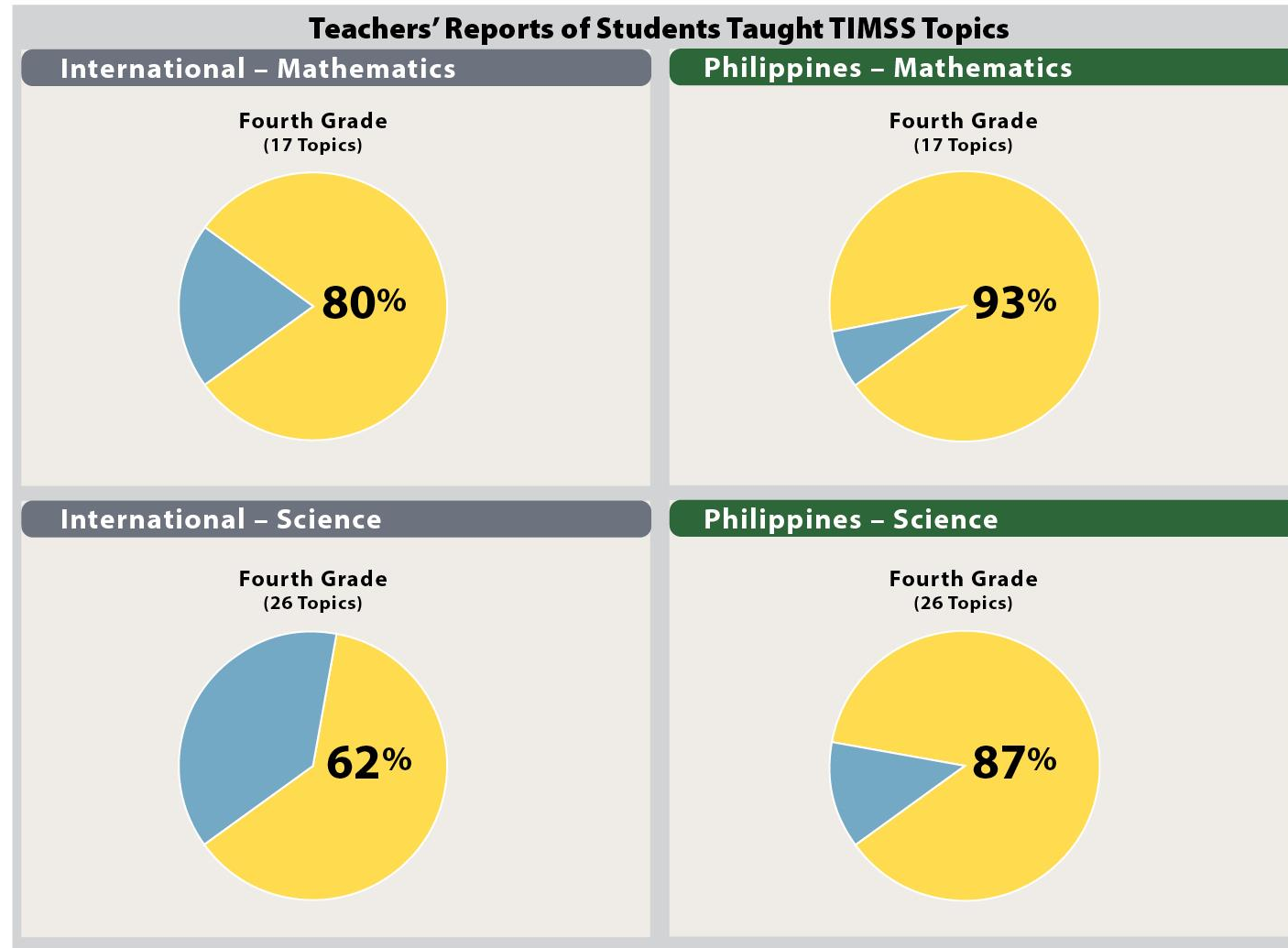
Why is it easier for Mary to move her box?

- A Gravity acting on Tina's box is much stronger.
- B Air resistance acting on Tina's box is much greater.
- C The cart increases the magnetic force acting on Mary's box.
- D The cart's wheels decrease the force needed to move Mary's box.

Percent Correct



Percentage of Students Taught the TIMSS Topics



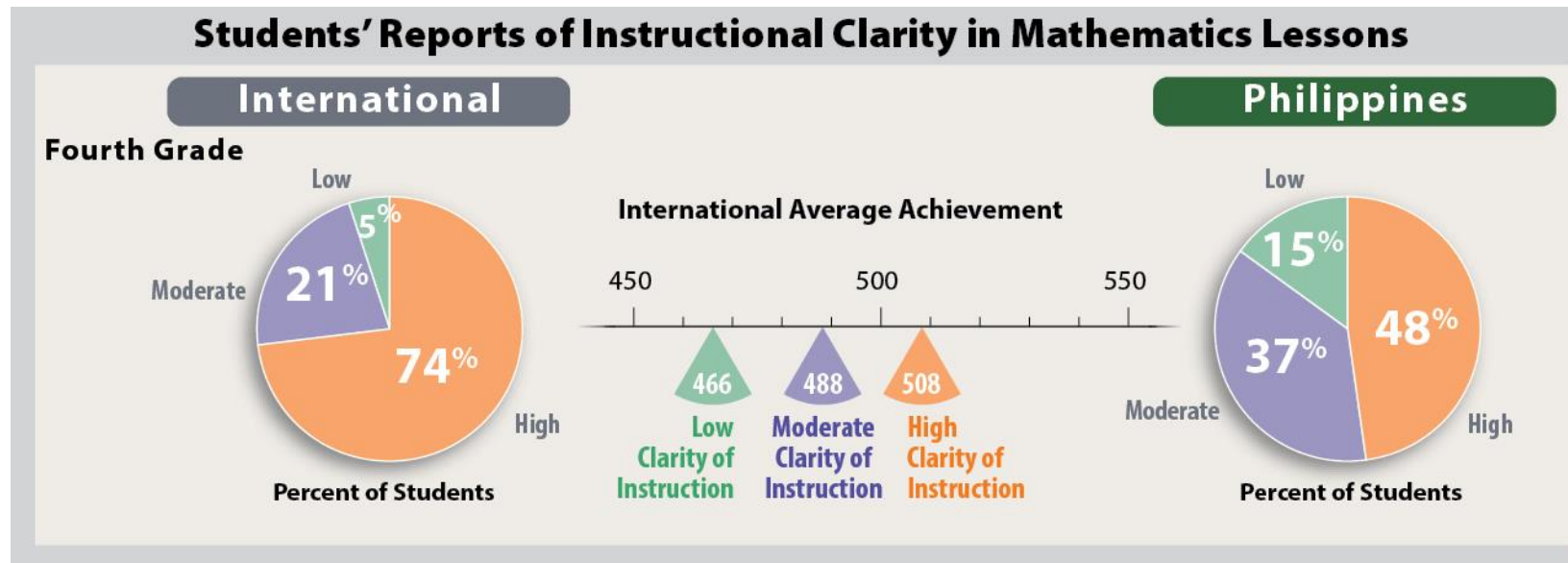
Additional Instructional Factors



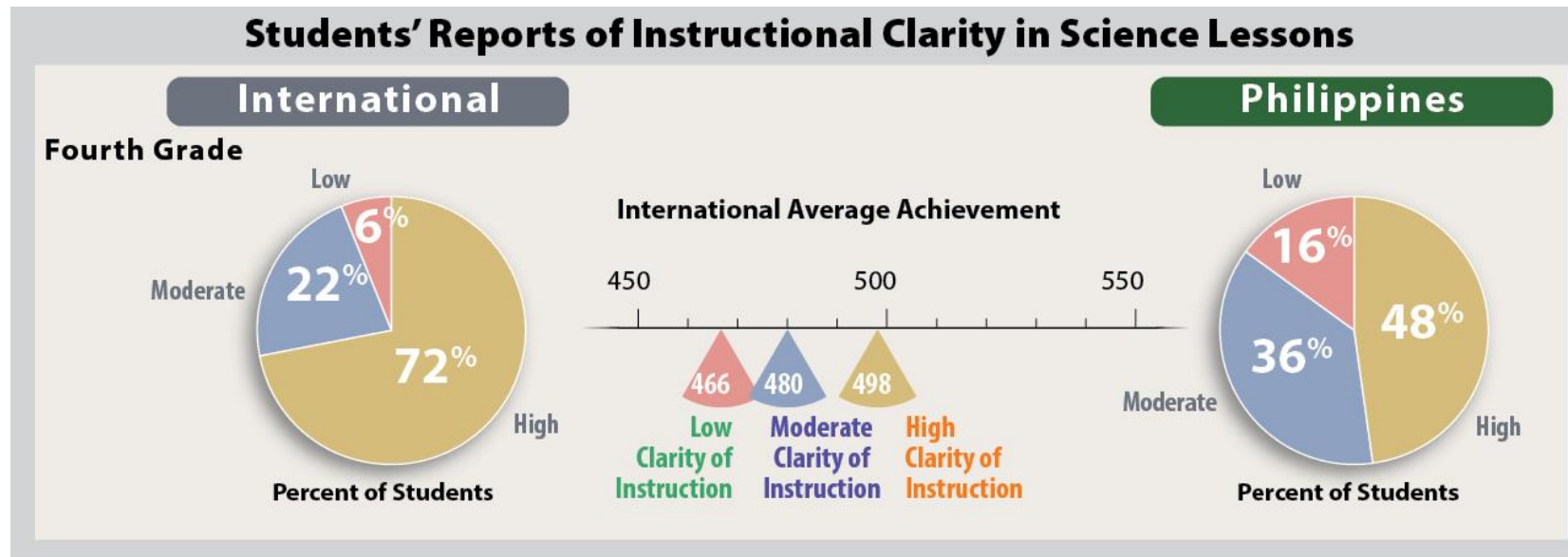
Students' Absenteeism

	Never or Almost Never	Once Every Two Months	Once a Month	Once Every Two Weeks	Once a Week
Fourth Grade					
International Average					
Percent of Students	61	13	10	5	11
Average Achievement	512	509	495	462	448
Philippines					
Percent of Students	32	9	14	13	32
Average Achievement	329	294	265	263	301

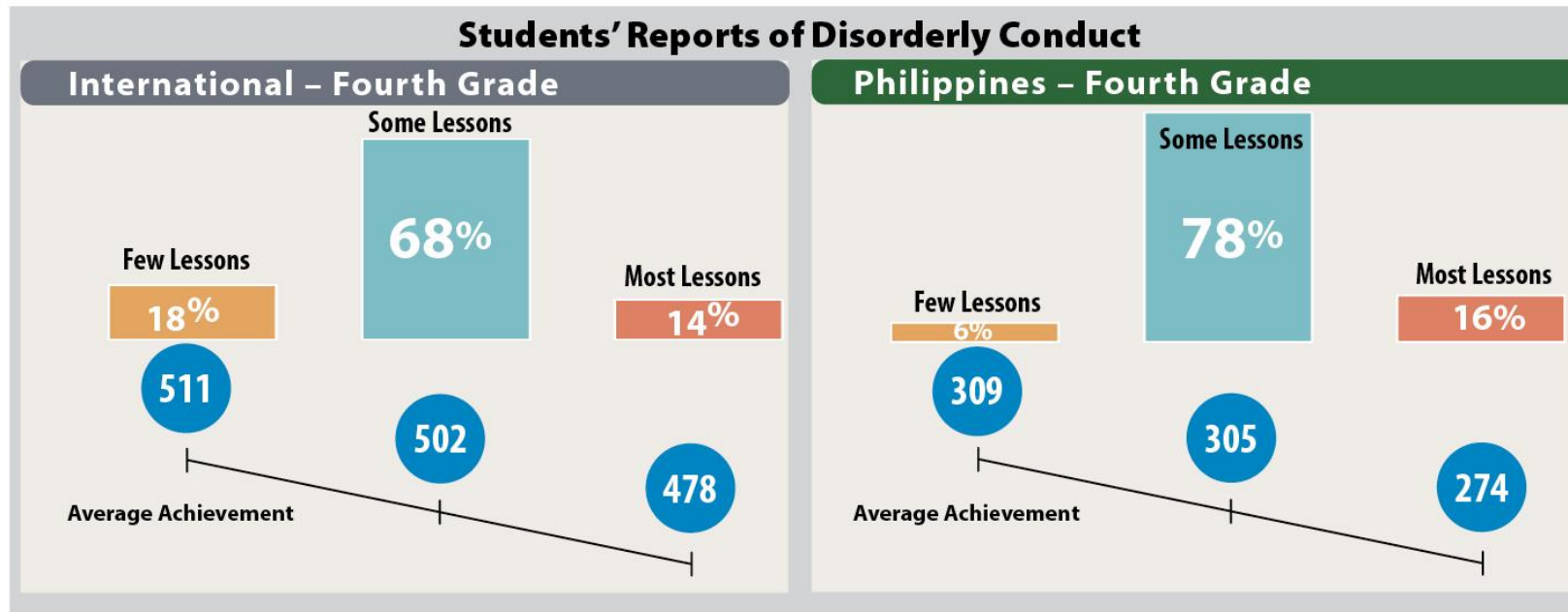
Instructional Clarity in Mathematics Lessons



Instructional Clarity in Science Lessons



Disorderly Behavior During Mathematics Lessons



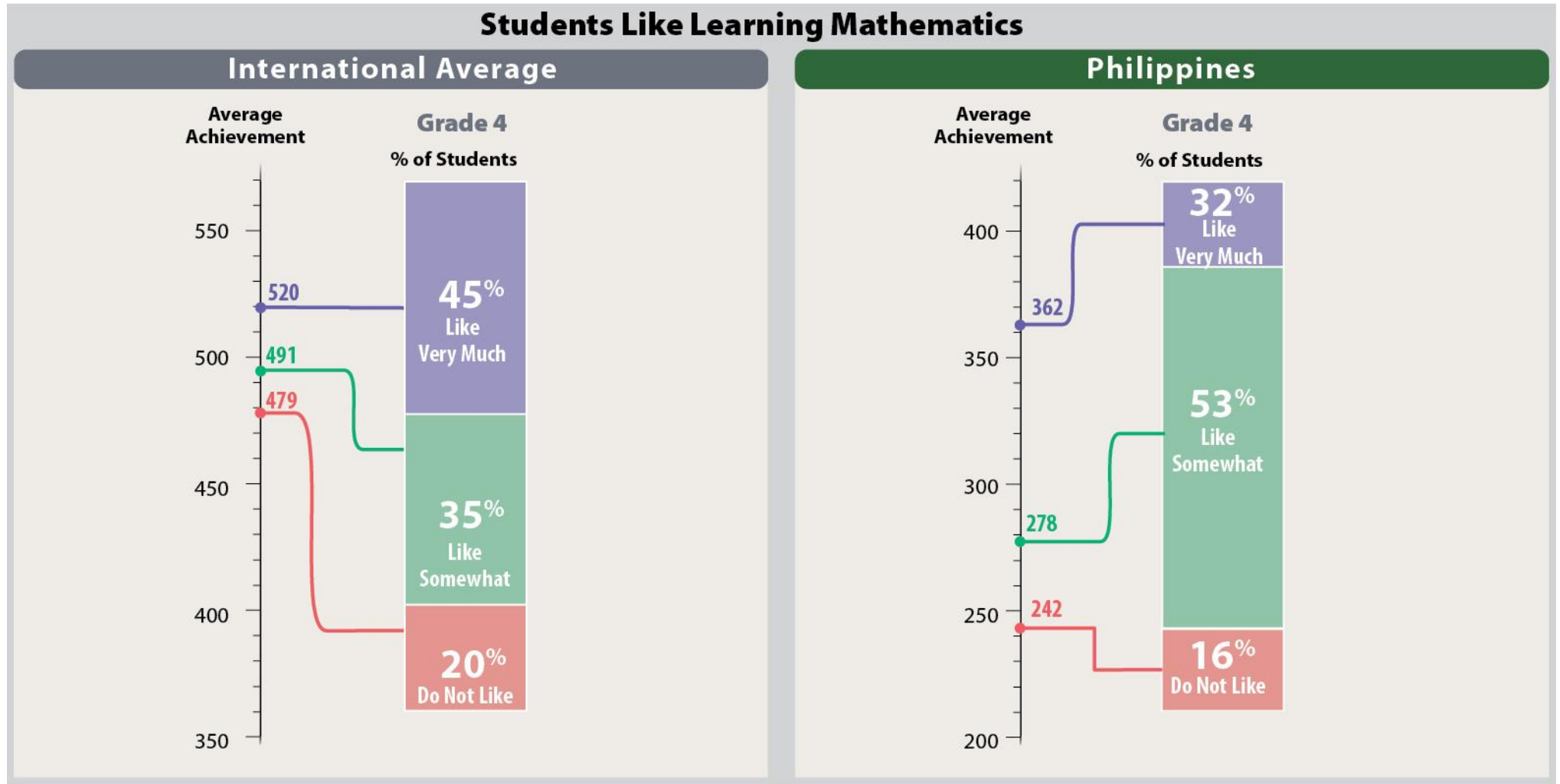
Technology Instruction in Mathematics

	Every or Almost Every Day	Once or Twice a Week	Once or Twice a Month	Never or Almost Never
Fourth Grade				
International Average				
Percent of Students	7	14	13	67
Achievement	515	509	510	500
Philippines				
Percent of Students	3	9	11	77
Achievement	321	284	341	290

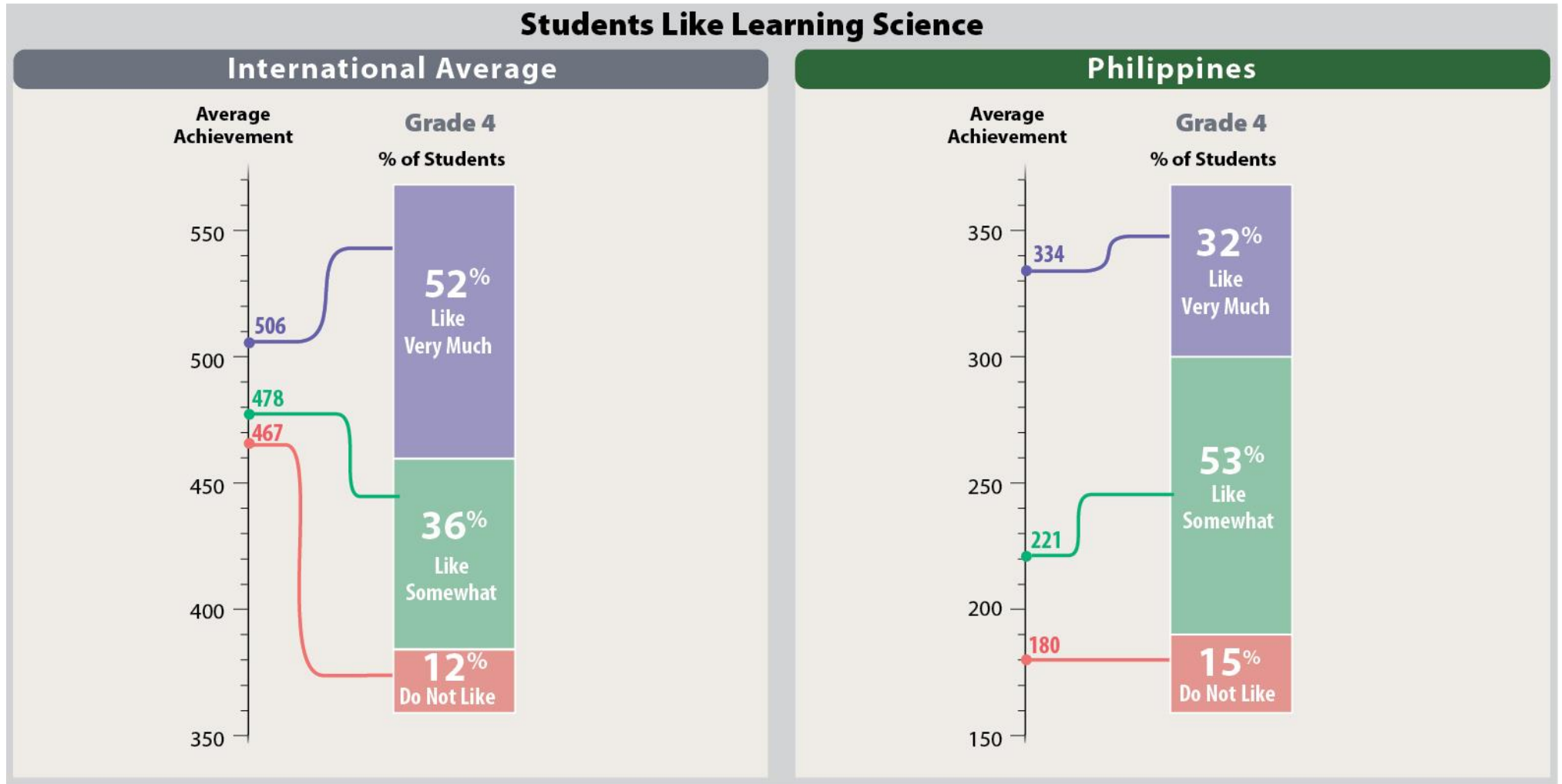
Technology Instruction in Science

	Every or Almost Every Day	Once or Twice a Week	Once or Twice a Month	Never or Almost Never
Fourth Grade				
International Average				
Percent of Students	6	13	20	60
Achievement	498	498	500	490
Philippines				
Percent of Students	12	28	19	41
Achievement	253	253	256	251

Students' Attitudes Toward Mathematics



Students' Attitudes Toward Science



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Thank you

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