

REFERENCE 2

The Mathematics
Curriculum

R

2



	Achievement Standards
Australia	Achievement standards are stated as learning outcomes.
Belgium (Flemish)	Achievement standards are stated in terms of final learning objectives for A Stream and developmental objectives for B Stream. Students not meeting the standards may need to repeat the grade, receive reduced hours of instruction, or be moved to an easier class.
Bulgaria	Achievement standards are stated as broad descriptions of what students should know. Students not meeting the standards take an extra exam to be promoted; some students may need to repeat the grade.
Canada	Achievement standards are stated as specific learning outcomes. Students are expected to learn each concept, topic, or application.
Chile	There are no performance standards but there are objectives describing what students should learn. The revised curriculum will include performance standards stated as expected learning outcomes.
Chinese Taipei	The curriculum does not incorporate achievement standards.
Cyprus	The curriculum does not incorporate achievement standards.
Czech Republic	The curriculum provides a description of the skills and knowledge students must have. Teachers decide if the student has met the curriculum standards and considers this in promotion. If a student fails a single subject, the student must repeat the grade.
England	Achievement standards are established as a system of levels, each level with its own description of performance. On average, at age 7 students are expected to be at level 2; at age 11 level 4; and at age 13 level 5/6. One level is regarded as two years progress. The government has set a target of 75% of 11 year olds reaching level 4 (or above) in mathematics by the year 2002.
Finland	The curriculum does not incorporate achievement standards.
Hong Kong, SAR	The achievement standards are stated as learner-centered objectives. A core of content is identified in the mathematics curriculum; exams and assessments have a portion of items from this core.
Hungary	Standards are stated as learning objectives.
Indonesia	There are instructional objectives in the curriculum but no performance standards.
Iran, Islamic Rep.	The curriculum does not incorporate achievement standards.
Israel	The curriculum does not incorporate achievement standards.
Italy	The curriculum does not incorporate achievement standards.
Japan	Achievement standards are stated in the national curriculum as learning objectives, such as "To help students..." or "To enable students to..."
Jordan	Objectives are defined in the curriculum and the minimum percent of attainment for each objective is specified (e.g., performs operations on real numbers - 80%).
Korea, Rep. of	Achievement standards will be included in the revised curriculum (to be implemented at the 8th grade in 2001).
Latvia (LSS)	The curriculum incorporates achievement standards.
Lithuania	Achievement standards are not a part of curricula, but are prepared as a separate document. The draft of the National Educational Standards was released in 1997. As of 1999, the document had not been officially approved.
Macedonia, Rep. Of	Achievement standards are stated as learning objectives.
Malaysia	Achievement standards are stated as mathematic skills in the curriculum content specifications document.
Moldova	The curriculum incorporates achievement standards.
Morocco	The curriculum does not incorporate achievement standards.
Netherlands	Achievement standards are stated as learning objectives, such as "Students develop a competence..." or "Students learn to research..."
New Zealand	Achievement standards are stated as learning outcomes expressed at eight levels of learning independent of age and grade.
Philippines	Achievement standards are stated as learning competencies.
Romania	The achievement standards are stated as learning objectives, such as "The student should be able to arrive at a conclusion based on experimental work".
Russian Federation	The requirements for content of instruction and for students' knowledge and performance (learning outcomes: "student should...") are included in the curriculum. They are recommended for schools by the Ministry of Education.
Singapore	Achievement standards are stated in terms of learning objectives and assessment guidelines (i.e. table of specifications).
Slovak Republic	Learning objectives are included in the curriculum. Performance standards are in development.
Slovenia	The curriculum states standards for student performance by grade level and subject area. If a student's achievement in a subject is under minimal standard, the student receives an unsatisfactory mark and must take a correcting exam in that subject. Students receiving three or more unsatisfactory marks must repeat the grade.
South Africa	The standards are not specific. A list of content to be covered is provided.
Thailand	The achievement standards describe what students should learn including performance levels and explicit criteria. Students must pass 50% of the standards. (The standards are set by the department that conducts the assessments and are NOT prescribed in the national curriculum.) Passing or failing the standards has no consequences for students.
Tunisia	Achievement standards are stated as learning objectives.
Turkey	Achievement standards are stated as objectives, such as "Ability to understand/know..."
United States	By 1999, all states were required to have performance standards.

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by National Research Coordinators.

Australia	57 (4.0)	57 (4.3)	76 (3.6)	76 (4.0)	33 (3.9)
Belgium (Flemish)	66 (5.1)	11 (3.2)	36 (5.0)	81 (4.7)	100 (0.0)
Bulgaria	64 (5.1)	62 (5.1)	42 (5.1)	28 (4.4)	10 (2.5)
Canada	s 77 (3.4)	s 43 (4.3)	s 66 (3.8)	s 87 (2.5)	

An "r" indicates school response data available for 70-84% of students. An "s" indicates school response data available for 50-69% of students.

Background data provided by schools.

‡ Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

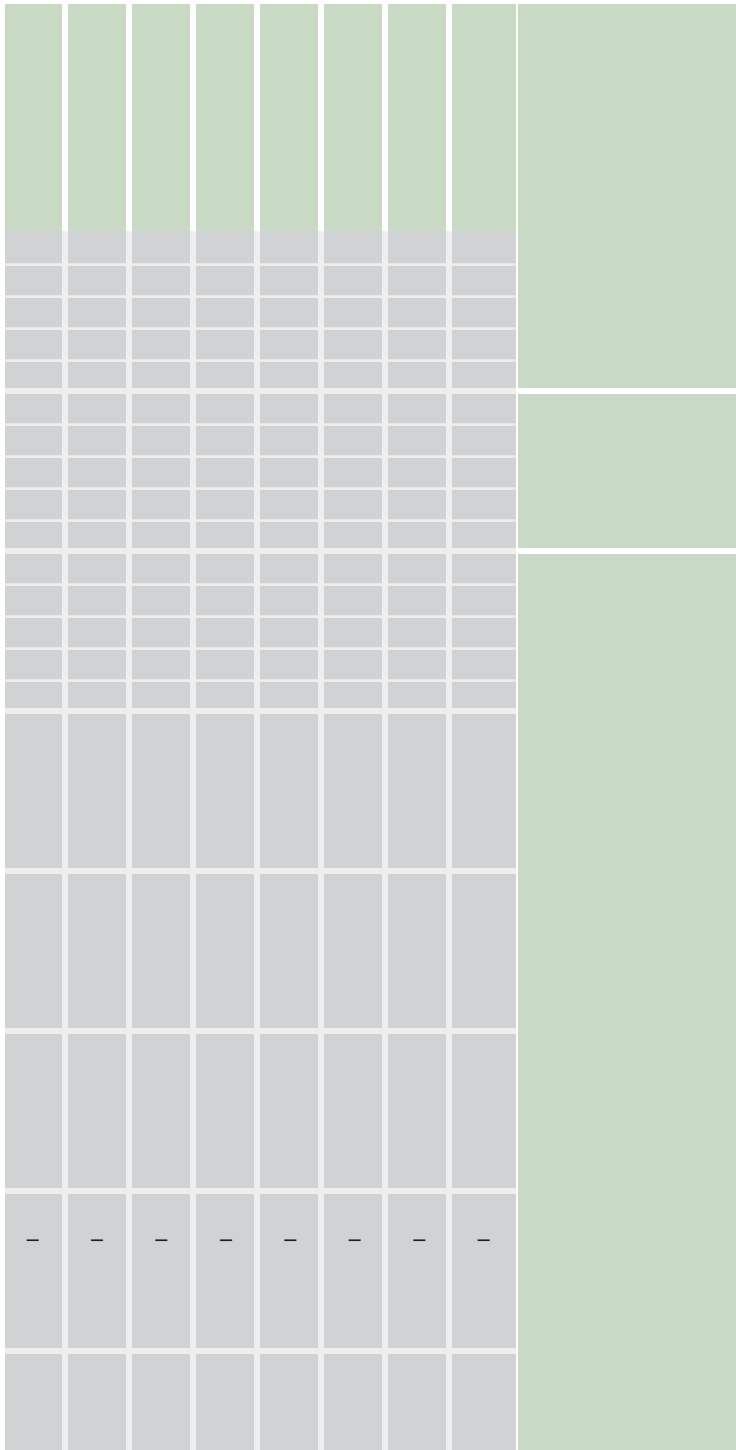
An "r" indicates school response data available for 70-84% of students. An "s" indicates school response data available for 50-69% of students.

Exhibit R2.3 Detailed Information About Topics in the Intended Curriculum, Up to and Including Eighth Grade - Fractions and Number Sense

	Whole numbers – including place values, factorization and operations (+, −, ×, ÷)	Understanding and representing common fractions	Computations with common fractions	Understanding and representing decimal fractions	Computations with decimal fractions	Relationships between common and decimal fractions, ordering of fractions	Rounding whole numbers and decimal fractions	Estimating the results of computations	Number lines
Australia	●	●	●	●	●	●	●	●	●
Belgium (Flemish)	●	●	●	●	●	●	●	●	●
Bulgaria	●	●	●	●	●	●	●	●	●
Canada	●	●	●	●	●	●	●	●	●
Chile	●	●	●	●	●	●	●	●	●
Chinese Taipei	●	●	●	●	●	●	●	●	●
Cyprus	●	●	●	●	●	●	●	●	●
Czech Republic	●	●	●	●	●	●	●	●	●
England	●	●	●	●	●	●	●	●	●
Finland	●	●	●	●	●	●	●	●	●
Hong Kong, SAR	●	●	●	●	●	●	●	●	●
Hungary	●	●	●	●	●	●	●	●	●
Indonesia	●	●	●	●	●	●	●	●	●
Iran, Islamic Rep.	●	●	●	●	●	●	●	●	●
Israel	●	●	●	●	●	●	●	●	●
Italy	●	●	●	●	●	●	●	●	●
Japan	●	●	●	●	●	●	●	●	●
Jordan	●	●	●	●	●	●	●	●	●
Korea, Rep. of	●	●	●	●	●	●	●	●	●
Latvia (LSS)	●	●	●	●	●	●	●	●	●
Lithuania	●	●	●	●	●	●	●	●	●
Macedonia, Rep. of	●	●	●	●	●	●	●	●	●
Malaysia	●	●	●	●	●	●	●	●	●
Moldova	●	●	●	●	●	●	●	●	●
Morocco	●	●	●	●	●	●	●	●	●
Netherlands	●	●	●	●	●	●	●	●	●
New Zealand	●	●	●	●	●	●	●	●	●
Philippines	●	●	●	●	●	●	●	●	●
Romania	●	●	●	●	●	●	●	●	●
Russian Federation	●	●	●	●	●	●	●	●	●
Singapore	●	●	●	●	●	●	●	●	●
Slovak Republic	—	—	—	—	—	—	—	—	—
Slovenia	●	●	●	●	●	●	●	●	●
South Africa	●	●	●	●	●	●	●	●	●
Thailand	●	●	●	●	●	●	●	●	●
Tunisia	●	●	●	●	●	●	●	●	●
Turkey	●	●	●	●	●	●	●	●	●
United States	●	●	●	●	●	●	●	●	●

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998–1999.

Background data provided by National Research Coordinators.



- All or almost all students (at least 90%)
- About half of the students
- Only the more able students (top track-about 25%)
- Only the most advanced students (10% or less)
- Not included in curriculum
- Data not available

Exhibit R2.4 Detailed Information About Topics in the Intended Curriculum, Up to and Including Eighth Grade - Measurement

	Units of measurement; standard metric units	Reading measurement instruments	Estimates of measurement; accuracy of measurement	Conversions of units between measurement systems	Perimeter and area of simple shapes – triangles, rectangles, and circles	Perimeter and area of combined shapes	Volume of rectangular solids i.e., Volume = length x width x height	Volume of other solids (e.g., pyramids, cylinders, cones, spheres)	Computing with measurements (+, -, x, ÷)	Scales applied to maps and models
Australia	●	●	●	●	●	●	●	●	●	●
Belgium (Flemish)	●	●	●	●	●	●	●	●	●	●
Bulgaria	●	●	●	●	●	●	●	●	●	●
Canada	●	●	●	●	●	●	●	●	●	●
Chile	●	●	○	●	●	●	●	○	●	●
Chinese Taipei	●	●	●	●	●	●	●	○	●	●
Cyprus	●	○	○	●	●	●	●	●	○	●
Czech Republic	●	●	●	○	●	●	●	●	●	●
England	●	●	●	●	●	●	●	○	●	●
Finland	●	●	●	●	●	○	●	○	●	●
Hong Kong, SAR	●	●	●	○	●	●	●	○	●	●
Hungary	●	●	●	○	●	○	●	○	●	○
Indonesia	●	●	●	●	●	●	●	●	●	●
Iran, Islamic Rep.	●	●	●	●	●	●	●	●	●	●
Israel	●	○	○	●	●	○	●	○	○	●
Italy	●	●	○	●	●	●	●	●	●	○
Japan	●	●	●	●	●	●	●	●	●	●
Jordan	●	●	●	●	●	●	●	●	●	●
Korea, Rep. of	●	●	●	●	●	●	●	●	●	●
Latvia (LSS)	●	●	●	●	●	○	●	●	●	●
Lithuania	●	●	●	●	●	●	●	●	●	●
Macedonia, Rep. of	●	○	○	○	●	●	●	●	●	○
Malaysia	●	●	●	●	●	●	○	●	●	●
Moldova	●	●	●	●	●	●	○	●	●	●
Morocco	●	●	●	●	●	●	●	●	●	○
Netherlands	●	●	○	○	●	●	●	●	●	●
New Zealand	●	●	●	○	●	●	●	●	●	●
Philippines	●	●	○	●	●	●	●	●	●	●
Romania	●	●	●	●	●	●	●	●	●	●
Russian Federation	●	●	●	○	●	○	●	○	●	●
Singapore	●	●	●	●	●	●	●	●	●	●
Slovak Republic	—	—	—	—	—	—	—	—	—	—
Slovenia	●	●	●	●	●	●	●	●	●	●
South Africa	●	●	●	●	●	●	●	●	●	●
Thailand	●	●	●	●	●	●	○	●	●	●
Tunisia	●	●	○	●	●	●	●	●	●	●
Turkey	●	○	●	●	●	●	●	●	●	●
United States	●	●	●	●	●	●	●	●	●	●

- All or almost all students (at least 90%)
- About half of the students
- Only the more able students (top track-about 25%)
- Only the most advanced students (10% or less)
- Not included in curriculum
- Data not available

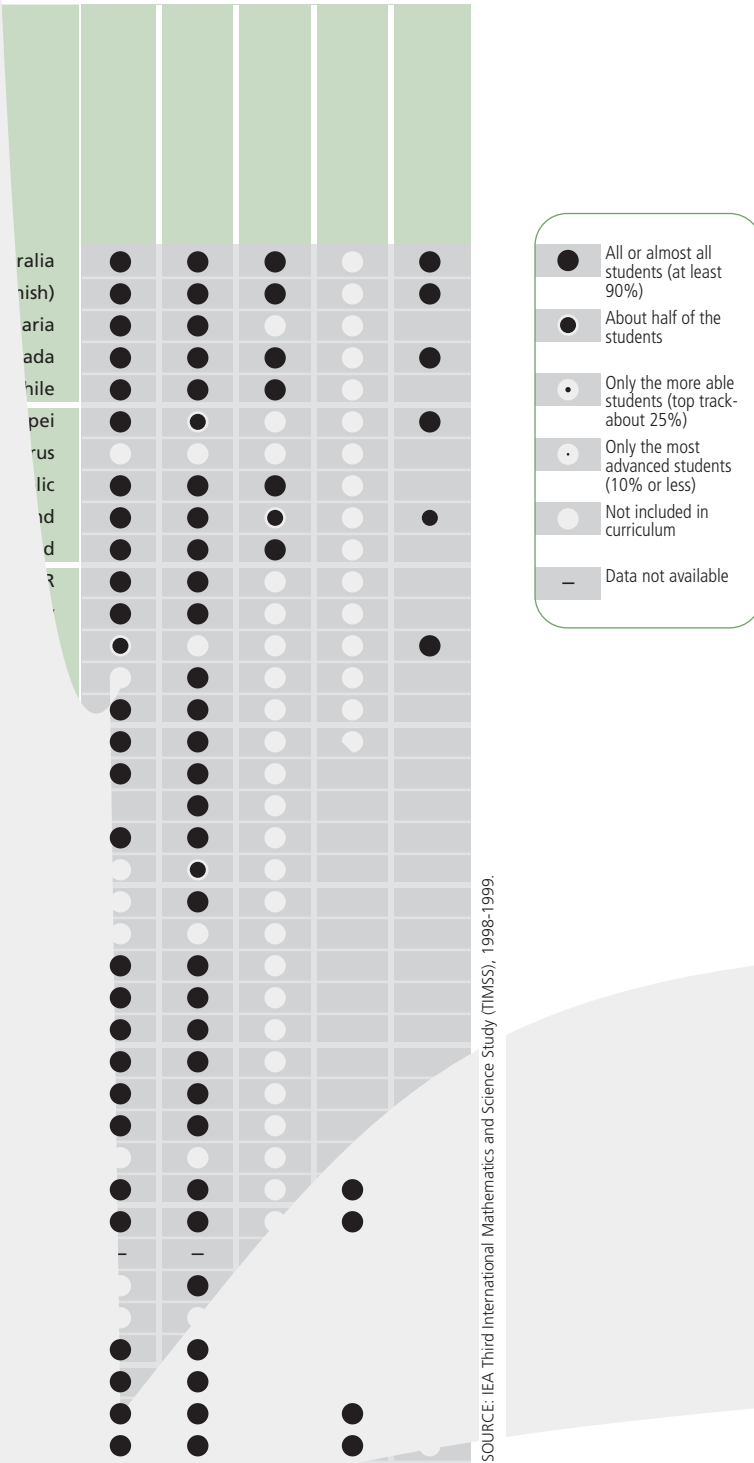
SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by National Research Coordinators.

Exhibit R2.5

Detailed Information About Topics in the Intended Curriculum, Up to and Including Eighth Grade - Data Representation, Analysis, and Probability

Mathematics



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

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Exhibit R2.6 Detailed Information About Topics in the Intended Curriculum, Up to and Including Eighth Grade - Geometry

	Cartesian coordinates of points in a plane	Coordinates of points on a given straight line	Simple two dimensional geometry – angles on a straight line, parallel lines, triangles and quadrilaterals	Congruence and similarity	Angles – (acute, right, supplementary, etc.)	Pythagorean theorem (without proof)	Symmetry and transformations (reflection and rotation)	Visualization of three-dimensional shapes	Geometric constructions with straight-edge and compass	Regular polygons and their properties – names (e.g., hexagon and octagon), sum of angles, etc.	Proofs (formal deductive demonstrations of geometric relationships)	Sine, cosine, and tangent in right-angle triangles	Nets of solids
Australia	●	●	●	●	●	●	●	●	●	●	○	○	●
Belgium (Flemish)	●	●	●	●	●	○	●	●	●	○	●	○	●
Bulgaria	●	●	●	●	●	○	●	●	●	●	●	○	○
Canada	●	●	●	●	●	●	●	●	●	●	○	○	●
Chile	●	○	●	○	●	●	●	○	●	○	○	○	●
Chinese Taipei	●	●	●	○	●	●	○	○	●	●	○	○	○
Cyprus	●	●	●	○	●	●	○	○	●	●	○	○	○
Czech Republic	●	○	●	●	●	●	●	●	●	●	○	○	○
England	●	●	○	○	○	○	●	○	○	○	○	○	○
Finland	●	○	●	○	●	○	○	○	○	○	○	○	○
Hong Kong, SAR	●	●	●	●	●	●	○	○	●	○	○	○	○
Hungary	●	○	●	○	●	●	●	○	●	●	○	○	○
Indonesia	●	●	●	●	●	●	●	○	●	○	○	○	○
Iran, Islamic Rep.	●	●	●	●	●	●	●	○	○	○	○	○	○
Israel	●	○	○	●	●	○	○	○	○	○	○	○	○
Italy	●	●	●	●	●	●	●	○	○	○	○	○	○
Japan	●	●	●	●	●	○	●	○	○	○	○	○	○
Jordan	●	●	●	●	●	●	○	○	○	○	○	○	○
Korea, Rep. of	○	○	●	●	●	○	○	○	○	○	○	○	○
Latvia (LSS)	●	●	●	●	●	●	○	○	○	○	○	○	○
Lithuania	●	●	●	●	●	●	○	○	○	○	○	○	○
Macedonia, Rep. of	○	●	●	●	●	●	○	○	○	○	○	○	○
Malaysia	●	●	●	●	●	●	○	○	○	○	○	○	○
Moldova	●	●	●	●	●	●	○	○	○	○	○	○	○
Morocco	○	○	●	●	●	○	○	○	○	○	○	○	○
Netherlands	●	●	●	○	●	●	○	○	○	○	○	○	○
New Zealand	●	●	●	●	●	○	○	○	○	○	○	○	○
Philippines	○	○	●	●	●	○	○	○	○	○	○	○	○
Romania	●	●	●	●	●	●	○	○	○	○	○	○	○
Russian Federation	●	●	●	○	●	●	○	○	○	○	○	○	○
Singapore	●	●	●	●	●	○	○	○	○	○	○	○	○
Slovak Republic	–	–	–	–	–	–	–	–	–	–	–	–	–
Slovenia	●	●	●	●	●	●	○	○	○	○	○	○	○
South Africa	○	○	●	●	●	●	○	○	○	○	○	○	○
Thailand	●	●	●	●	●	●	○	○	○	○	○	○	○
Tunisia	○	●	●	○	●	○	○	○	○	○	○	○	○
Turkey	●	●	●	●	●	●	○	○	○	○	○	○	○
United States	●	●	●	●	●	●	○	○	○	○	○	○	○

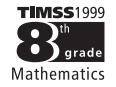
- All or almost all students (at least 90%)
- About half of the students
- Only the more able students (top track about 25%)
- Only the most advanced students (10% or less)
- Not included in curriculum
- Data not available

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by National Research Coordinators.

Exhibit R2.7

Detailed Information About Topics in the Intended Curriculum, Up to and Including Eighth Grade - Algebra



	Number patterns and simple relations	Writing expressions for general terms in number pattern sequence	Translating from verbal descriptions to symbolic expressions	Simple algebraic expressions	Evaluating simple algebraic expressions by substitution of given value of variables	Representing situations algebraically; formulas	Solving simple equations	Solving simple inequalities	Solving simultaneous equations in two variables	Interpreting linear relations	Using the graph of a relationship to interpolate/extrapolate
Australia	●	●	●	●	●	●	●	○	○	●	○
Belgium (Flemish)	●	●	●	●	●	●	●	○	○	○	○
Bulgaria	●	○	●	●	●	●	●	●	●	●	○
Canada	●	●	●	●	●	●	●	○	○	○	○
Chile	○	○	○	●	○	○	●	○	○	○	○
Chinese Taipei	●	○	●	●	●	○	●	○	●	○	○
Cyprus	●	○	●	●	●	●	●	●	○	○	○
Czech Republic	○	○	●	●	●	●	●	○	○	○	○
England	●	○	○	○	○	○	○	○	○	○	○
Finland	●	○	●	●	●	●	●	○	○	○	○
Hong Kong, SAR	●	○	●	●	●	●	●	○	●	●	○
Hungary	●	○	●	●	●	●	●	●	○	●	●
Indonesia	●	●	●	●	●	●	●	●	○	○	○
Iran, Islamic Rep.	●	○	●	●	●	●	●	●	●	○	○
Israel	○	○	●	●	●	●	●	○	○	○	○
Italy	●	●	●	●	●	●	●	●	●	●	○
Japan	●	●	●	●	●	●	●	●	●	●	●
Jordan	●	○	●	●	●	●	●	○	●	●	○
Korea, Rep. of	●	○	●	●	●	●	●	●	●	●	●
Latvia (LSS)	●	●	●	●	●	●	●	●	●	○	○
Lithuania	●	●	●	●	●	●	●	●	○	○	○
Macedonia, Rep. of	○	○	●	●	●	●	●	●	●	●	○
Malaysia	●	●	●	●	●	●	●	○	○	○	○
Moldova	●	●	●	●	●	●	●	●	●	●	●
Morocco	○	○	○	○	○	○	●	○	○	○	○
Netherlands	●	○	○	○	○	○	○	○	○	●	●
New Zealand	●	○	●	●	●	○	●	○	○	●	●
Philippines	●	●	●	●	●	●	●	●	○	○	○
Romania	●	●	●	●	●	●	●	●	●	●	●
Russian Federation	○	○	●	●	●	●	●	●	●	●	○
Singapore	●	●	●	●	●	●	●	○	●	●	●
Slovak Republic	—	—	—	—	—	—	—	—	—	—	—
Slovenia	●	●	●	●	●	●	●	●	○	●	●
South Africa	●	●	●	●	●	●	●	○	○	○	○
Thailand	○	○	●	●	●	●	●	○	○	●	●
Tunisia	●	○	●	●	●	●	●	○	○	○	○
Turkey	●	●	●	●	●	●	●	●	●	●	●
United States	●	●	●	●	●	●	●	○	○	○	○

- All or almost all students (at least 90%)
- About half of the students
- Only the more able students (top track-about 25%)
- Only the most advanced students (10% or less)
- Not included in curriculum
- Data not available

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by National Research Coordinators.

Exhibit R2.8 When Fractions and Number Sense Topics Are Taught*

	Percentage of Students					
	Taught Topics Before This Year Only		Taught Topics During This Year ¹			Not Yet Taught 50% or More of Topics
	More Than 80% of Topics	More Than 50% Up to and Including 80% of Topics	More Than 50% of Topics Each Taught More Than 5 Periods	More Than 50% of Topics Each Taught at Least 1-5 Periods	50% or Less of Topics Taught	
Australia	7 (2.3)	18 (3.6)	19 (3.5)	53 (5.2)	3 (1.3)	0 (0.0)
Belgium (Flemish)	21 (3.0)	19 (2.3)	2 (1.0)	42 (3.7)	10 (3.6)	6 (2.9)
Bulgaria s	60 (4.8)	29 (4.3)	1 (0.9)	7 (2.0)	2 (1.5)	1 (0.9)
Canada r	1 (0.6)	9 (2.0)	27 (2.7)	63 (3.3)	1 (0.4)	0 (0.3)
Chile	0 (0.0)	3 (1.3)	57 (3.9)	35 (3.7)	5 (1.6)	0 (0.0)
Chinese Taipei	90 (2.4)	8 (2.1)	0 (0.0)	2 (1.1)	0 (0.0)	0 (0.0)
Cyprus r	1 (1.1)	72 (4.2)	1 (0.0)	17 (2.9)	10 (3.3)	0 (0.0)
Czech Republic	53 (5.7)	25 (4.3)	5 (2.2)	16 (3.3)	1 (0.8)	0 (0.0)
England s	8 (2.4)	19 (3.3)	3 (0.9)	63 (4.8)	6 (2.1)	1 (0.6)
Finland	0 (0.3)	5 (1.3)	13 (3.3)	63 (3.9)	16 (3.3)	3 (1.6)
Hong Kong, SAR	18 (3.0)	56 (4.5)	2 (1.2)	18 (3.6)	5 (2.0)	1 (0.8)
Hungary	38 (4.0)	29 (3.6)	8 (2.3)	24 (3.6)	1 (0.0)	0 (0.0)
Indonesia	26 (4.1)	25 (4.2)	12 (2.8)	37 (4.6)	0 (0.5)	0 (0.0)
Iran, Islamic Rep.	3 (1.3)	27 (4.7)	1 (0.8)	63 (5.0)	5 (1.7)	0 (0.0)
Israel	38 (3.7)	37 (3.7)	3 (1.3)	18 (3.1)	4 (1.4)	1 (0.7)
Italy	39 (3.9)	42 (4.1)	4 (1.3)	14 (2.9)	1 (0.5)	0 (0.0)
Japan	51 (4.9)	30 (4.3)	1 (0.0)	16 (3.3)	2 (1.2)	0 (0.0)
Jordan	18 (3.3)	31 (3.9)	13 (2.9)	38 (4.2)	1 (0.0)	0 (0.0)
Korea, Rep. of	10 (2.4)	14 (2.8)	11 (2.5)	57 (4.0)	6 (2.0)	2 (1.3)
Latvia (LSS)	22 (3.7)	42 (4.3)	5 (2.0)	26 (4.0)	5 (1.9)	0 (0.0)
Lithuania †	--	--	--	--	--	--
Macedonia, Rep. of	81 (3.3)	5 (2.0)	1 (0.0)	1 (0.0)	1 (0.0)	12 (2.7)
Malaysia	8 (2.0)	29 (3.8)	13 (2.7)	48 (4.1)	1 (0.8)	1 (0.9)
Moldova	--	--	--	--	--	--
Morocco	--	--	--	--	--	--
Netherlands	8 (2.3)	28 (5.8)	17 (6.3)	41 (5.8)	5 (2.7)	0 (0.0)
New Zealand	0 (0.0)	1 (0.9)	14 (2.9)	83 (3.1)	1 (0.0)	2 (0.8)
Philippines	7 (2.1)	15 (3.2)	22 (3.7)	52 (4.2)	3 (1.3)	0 (0.0)
Romania	75 (3.9)	11 (2.8)	1 (0.7)	13 (2.9)	0 (0.0)	0 (0.0)
Russian Federation	--	--	--	--	--	--
Singapore	37 (4.2)	35 (4.3)	6 (2.0)	22 (3.7)	0 (0.0)	0 (0.0)
Slovak Republic	55 (4.5)	22 (4.2)	7 (2.7)	16 (2.6)	0 (0.0)	0 (0.0)
Slovenia	44 (4.1)	27 (4.2)	11 (2.4)	17 (3.1)	0 (0.0)	0 (0.0)
South Africa	--	--	--	--	--	--
Finland s	0 (0.0)	6 (2.0)	15 (4.1)	63 (4.5)	15 (4.0)	2 (1.9)
Tunisia	7 (2.3)	29 (4.0)	32 (4.6)	3 (1.5)	23 (3.7)	6 (2.2)
Turkey	16 (3.0)	28 (3.6)	8 (1.7)	35 (3.5)	13 (2.6)	0 (0.2)
United States	8 (1.4)	9 (1.4)	34 (2.8)	48 (3.2)	1 (0.7)	0 (0.1)
International Avg.	26 (0.5)	24 (0.6)	11 (0.5)	34 (0.6)	4 (0.3)	1 (0.2)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by teachers.

* Categories of topic coverage for fractions and number sense are based on combined responses to questions about the individual mathematics subtopics in the content area described in exhibit 5.12.

¹ For each topic in 5.12, teachers were asked if the topic was taught before this year, taught 1-5 periods this year, taught more than 5 periods this year, or not yet taught. Topics taught during this year, regardless if taught before this year, are included in this category.

† Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (–) indicates data are not available.

An “r” indicates teacher response data available for 70-84% of students. An “s” indicates teacher response data available for 50-69% of students.

Exhibit R2.9 When Measurement Topics Are Taught*

	Percentage of Students					
	Taught Topics Before This Year Only		Taught Topics During This Year ¹			Not Yet Taught 50% or More of Topics
	More Than 80% of Topics	More Than 50% Up to and Including 80% of Topics	More Than 50% of Topics Each Taught More Than 5 Periods	More Than 50% of Topics Each Taught at Least 1-5 Periods	50% or Less of Topics Taught	
Australia	3 (1.5)	6 (2.3)	20 (3.7)	64 (4.6)	6 (1.6)	2 (1.3)
Belgium (Flemish)	33 (3.5)	27 (3.8)	4 (3.4)	19 (3.0)	13 (3.7)	3 (1.4)
Bulgaria ^s	67 (4.9)	19 (3.8)	1 (0.1)	8 (2.3)	5 (1.9)	1 (0.7)
Canada ^r	1 (0.5)	8 (1.6)	21 (2.9)	56 (3.4)	11 (1.4)	2 (0.8)
Chile	1 (0.9)	7 (2.0)	20 (3.2)	35 (4.2)	12 (2.4)	24 (3.5)
Chinese Taipei	20 (3.6)	53 (4.4)	3 (1.4)	5 (1.8)	17 (3.3)	2 (1.4)
Cyprus ^s	0 (0.0)	16 (5.4)	10 (4.6)	51 (7.0)	23 (5.4)	0 (0.0)
Czech Republic	50 (5.9)	29 (5.0)	4 (2.0)	14 (3.4)	4 (1.7)	0 (0.0)
England ^s	8 (2.4)	18 (2.7)	5 (1.3)	58 (3.8)	8 (1.5)	3 (0.9)
Finland	2 (1.1)	6 (1.7)	3 (1.3)	41 (4.8)	21 (3.4)	28 (4.1)
Hong Kong, SAR	15 (3.1)	28 (4.2)	5 (1.8)	41 (4.4)	10 (2.8)	1 (1.1)
Hungary	31 (3.5)	33 (3.7)	7 (2.1)	28 (3.7)	2 (1.0)	0 (0.0)
Indonesia	9 (2.2)	18 (4.0)	13 (3.3)	51 (4.7)	8 (2.5)	0 (0.0)
Iran, Islamic Rep.	18 (2.7)	30 (4.5)	2 (0.8)	35 (4.1)	10 (2.6)	4 (1.7)
Israel ^s	37 (4.9)	14 (3.4)	3 (1.8)	10 (3.0)	7 (2.4)	29 (5.0)
Italy	29 (3.8)	42 (4.0)	7 (2.3)	15 (2.9)	7 (1.8)	1 (0.6)
Japan	49 (4.6)	26 (4.3)	1 (0.8)	8 (2.1)	5 (2.0)	12 (2.9)
Jordan	39 (4.4)	33 (4.3)	3 (1.5)	20 (3.3)	4 (1.7)	0 (0.0)
Korea, Rep. of	11 (2.5)	19 (3.3)	8 (2.4)	49 (4.1)	7 (2.0)	6 (1.7)
Latvia (LSS)	26 (4.0)	41 (4.4)	2 (1.0)	11 (3.0)	15 (2.9)	5 (2.1)
Lithuania [‡]	--	--	--	--	--	--
Macedonia, Rep. of ^r	31 (4.3)	44 (4.4)	2 (1.2)	7 (2.1)	4 (1.8)	13 (3.0)
Malaysia	18 (2.9)	18 (3.4)	7 (1.6)	46 (4.7)	9 (2.6)	2 (1.0)
Moldova	--	--	--	--	--	--
Morocco	--	--	--	--	--	--
Netherlands ^r	6 (3.3)	8 (2.7)	15 (6.2)	51 (6.8)	15 (3.6)	7 (4.7)
New Zealand	0 (0.0)	1 (0.8)	12 (2.6)	80 (3.3)	1 (0.9)	5 (1.8)
Philippines	5 (1.5)	1 (1.0)	20 (3.4)	53 (4.0)	6 (2.2)	15 (3.2)
Romania	69 (4.4)	20 (3.9)	1 (0.0)	10 (2.5)	1 (0.0)	0 (0.0)
Russian Federation	--	--	--	--	--	--
Singapore	39 (4.8)	32 (4.6)	8 (2.5)	19 (3.7)	2 (1.1)	0 (0.0)
Slovak Republic	23 (4.2)	40 (5.0)	6 (2.3)	23 (4.3)	8 (2.4)	0 (0.0)
Slovenia	29 (3.9)	34 (3.7)	8 (2.1)	26 (3.8)	3 (1.6)	0 (0.0)
South Africa	--	--	--	--	--	--
Thailand	4 (1.5)	11 (2.7)	13 (2.9)	55 (4.5)	6 (2.2)	10 (2.4)
Tunisia	33 (4.3)	40 (4.5)	8 (2.5)	2 (1.4)	10 (2.5)	8 (2.2)
Turkey	18 (3.3)	34 (3.8)	5 (1.5)	16 (2.3)	16 (2.9)	13 (2.8)
United States	10 (2.2)	11 (1.9)	16 (2.9)	54 (3.6)	3 (0.9)	6 (1.4)
International Avg.	22 (0.6)	23 (0.6)	8 (0.4)	32 (0.7)	8 (0.4)	6 (0.4)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by teachers.

* Categories of topic coverage for measurement are based on combined responses to questions about the individual mathematics subtopics in the content area described in exhibit 5.13.

¹ For each topic in 5.13, teachers were asked if the topic was taught before this year, taught 1-5 periods this year, taught more than 5 periods this year, or not yet taught. Topics taught during this year, regardless if taught before this year, are included in this category.

[‡] Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (–) indicates data are not available.

An "r" indicates teacher response data available for 70-84% of students. An "s" indicates teacher response data available for 50-69% of students.

Exhibit R2.10 When Data Representation, Analysis, and Probability Topics Are Taught*

	Percentage of Students					
	Taught Topics Before This Year Only		Taught Topics During This Year ¹			Not Yet Taught 50% or More of Topics
	More Than 80% of Topics	More Than 50% Up to and Including 80% of Topics	More Than 50% of Topics Each Taught More Than 5 Periods	More Than 50% of Topics Each Taught at Least 1-5 Periods	50% or Less of Topics Taught	
Australia	2 (1.2)	3 (1.8)	19 (2.8)	46 (4.2)	5 (1.9)	25 (3.5)
Belgium (Flemish)	8 (1.6)	23 (3.0)	0 (0.0)	27 (4.2)	24 (3.0)	18 (4.2)
Bulgaria (r)	2 (1.1)	8 (2.5)	4 (1.6)	10 (2.7)	12 (2.9)	64 (5.2)
Canada (r)	2 (0.8)	5 (1.6)	27 (3.2)	45 (3.4)	8 (0.8)	13 (3.0)
Chile	3 (1.4)	8 (2.3)	14 (2.5)	20 (3.3)	2 (1.1)	53 (3.5)
Chinese Taipei	2 (1.2)	3 (1.4)	1 (0.8)	1 (0.7)	1 (0.0)	92 (2.1)
Cyprus (r)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	100 (0.0)
Czech Republic	2 (1.7)	24 (5.1)	1 (1.0)	7 (2.1)	13 (3.8)	52 (5.3)
England (s)	7 (1.7)	15 (3.2)	11 (2.2)	62 (3.9)	3 (1.3)	3 (0.7)
Finland	0 (0.0)	1 (0.9)	2 (1.3)	35 (4.5)	10 (2.3)	52 (4.1)
Hong Kong, SAR	3 (1.6)	13 (3.1)	1 (0.9)	7 (2.3)	6 (2.2)	70 (4.2)
Hungary	6 (1.9)	20 (3.4)	7 (1.9)	45 (4.0)	15 (2.7)	8 (2.3)
Indonesia	2 (1.0)	0 (0.0)	21 (3.2)	70 (3.7)	1 (0.8)	6 (2.1)
Iran, Islamic Rep.	2 (1.1)	6 (1.9)	1 (0.8)	78 (4.4)	4 (1.5)	9 (3.9)
Israel (r)	13 (2.9)	12 (2.9)	6 (2.2)	12 (2.6)	13 (2.8)	44 (4.2)
Italy	2 (1.1)	17 (2.8)	10 (2.2)	33 (3.9)	4 (1.5)	34 (3.4)
Japan	2 (1.2)	8 (2.7)	1 (0.7)	12 (2.9)	10 (2.6)	68 (4.2)
Jordan	6 (2.1)	53 (4.3)	4 (1.8)	25 (3.9)	4 (1.7)	7 (2.6)
Korea, Rep. of	3 (1.3)	23 (3.4)	21 (3.2)	38 (4.0)	10 (2.5)	4 (1.6)
Latvia (LSS)	4 (1.8)	40 (4.3)	3 (1.3)	28 (3.9)	22 (3.8)	3 (1.7)
Lithuania [‡]	--	--	--	--	--	--
Macedonia, Rep. of (r)	16 (3.5)	16 (3.4)	2 (1.3)	16 (3.5)	18 (3.4)	31 (4.1)
Malaysia	3 (1.4)	6 (2.0)	12 (2.5)	13 (2.7)	0 (0.0)	66 (3.7)
Moldova	--	--	--	--	--	--
Morocco	--	--	--	--	--	--
Netherlands	0 (0.0)	7 (2.6)	17 (5.8)	48 (6.6)	6 (2.3)	22 (5.7)
New Zealand	1 (0.8)	1 (0.9)	12 (3.0)	65 (4.1)	1 (0.8)	19 (3.1)
Philippines	1 (0.0)	1 (0.9)	9 (2.3)	28 (4.1)	0 (0.0)	61 (4.5)
Romania	28 (4.1)	46 (4.9)	1 (0.7)	19 (3.5)	4 (1.6)	2 (1.3)
Russian Federation	--	--	--	--	--	--
Singapore	2 (1.4)	2 (1.3)	28 (3.7)	54 (3.2)	1 (0.0)	13 (3.3)
Slovak Republic	12 (3.2)	38 (5.0)	2 (1.7)	6 (2.4)	13 (3.1)	29 (4.3)
Slovenia	21 (3.2)	27 (4.2)	4 (1.9)	17 (3.4)	22 (3.3)	9 (2.5)
South Africa	--	--	--	--	--	--
Thailand	6 (2.1)	3 (1.5)	18 (3.3)	30 (4.2)	1 (1.0)	42 (4.4)
Tunisia	5 (2.0)	7 (2.3)	4 (1.8)	1 (0.0)	2 (1.1)	82 (3.7)
Turkey	1 (0.9)	21 (3.5)	14 (2.5)	43 (4.5)	8 (2.2)	14 (3.5)
United States	6 (1.5)	7 (2.5)	26 (2.4)	53 (3.2)	2 (1.1)	6 (1.3)
International Avg.	5 (0.3)	14 (0.5)	9 (0.4)	30 (0.6)	7 (0.4)	34 (0.6)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by teachers.

* Categories of topic coverage for data representation, analysis, and probability are based on combined responses to questions about the individual mathematics subtopics in the content area described in exhibit 5.14.

¹ For each topic in 5.14, teachers were asked if the topic was taught before this year, taught 1-5 periods this year, taught more than 5 periods this year, or not yet taught. Topics taught during this year, regardless if taught before this year, are included in this category.

[‡] Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (-) indicates data are not available.

An "r" indicates teacher response data available for 70-84% of students. An "s" indicates teacher response data available for 50-69% of students.

Exhibit R2.11 When Geometry Topics Are Taught*

	Percentage of Students					
	Taught Topics Before This Year Only		Taught Topics During This Year ¹			Not Yet Taught 50% or More of Topics
	More Than 80% of Topics	More Than 50% Up to and Including 80% of Topics	More Than 50% of Topics Each Taught More Than 5 Periods	More Than 50% of Topics Each Taught at Least 1-5 Periods	50% or Less of Topics Taught	
Australia	2 (0.9)	3 (1.4)	14 (3.4)	47 (4.6)	14 (3.1)	19 (3.9)
Belgium (Flemish)	0 (0.0)	5 (1.4)	10 (1.9)	47 (3.5)	15 (2.1)	22 (2.4)
Bulgaria	1 (0.7)	19 (3.8)	7 (2.3)	24 (4.2)	38 (6.2)	11 (3.0)
Canada ^r	2 (0.5)	3 (1.0)	14 (2.9)	52 (3.2)	12 (2.2)	18 (2.6)
Chile	3 (1.3)	4 (1.4)	12 (2.5)	20 (3.0)	19 (2.8)	42 (3.7)
Chinese Taipei	1 (0.0)	1 (0.5)	6 (2.1)	18 (3.3)	42 (4.1)	33 (4.1)
Cyprus ^r	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	14 (3.7)	86 (3.7)
Czech Republic	35 (4.6)	23 (4.8)	4 (2.3)	17 (3.1)	17 (3.8)	4 (1.9)
England ^s	13 (2.4)	18 (3.1)	2 (0.8)	29 (2.5)	23 (3.4)	15 (2.7)
Finland	0 (0.0)	0 (0.0)	1 (0.8)	39 (4.3)	4 (1.7)	56 (4.3)
Hong Kong, SAR	13 (2.7)	21 (3.5)	5 (2.0)	16 (2.7)	30 (4.0)	14 (3.2)
Hungary	9 (2.4)	21 (3.0)	14 (3.0)	25 (3.4)	28 (3.5)	3 (1.3)
Indonesia	6 (2.1)	2 (1.3)	9 (2.7)	42 (4.7)	18 (3.2)	22 (3.5)
Iran, Islamic Rep.	0 (0.0)	5 (3.7)	5 (1.6)	81 (4.0)	5 (1.8)	4 (1.6)
Israel ^r	0 (0.5)	2 (1.0)	11 (2.7)	20 (3.3)	20 (3.4)	47 (4.0)
Italy	2 (1.0)	10 (2.8)	9 (2.2)	29 (3.6)	41 (3.9)	9 (2.3)
Japan	2 (1.5)	21 (3.2)	8 (2.4)	35 (4.1)	32 (4.4)	1 (1.0)
Jordan	1 (0.0)	3 (1.4)	18 (3.6)	53 (4.1)	22 (3.5)	3 (1.6)
Korea, Rep. of	5 (1.8)	6 (1.8)	12 (2.4)	57 (4.4)	19 (3.4)	1 (0.0)
Latvia (LSS)	1 (0.8)	6 (2.1)	1 (0.9)	8 (2.3)	58 (4.7)	26 (3.9)
Lithuania [‡]	--	--	--	--	--	--
Macedonia, Rep. of	20 (3.3)	37 (4.1)	3 (1.3)	12 (2.9)	18 (3.5)	10 (2.7)
Malaysia	2 (1.0)	1 (0.7)	17 (3.1)	45 (4.0)	8 (2.5)	28 (3.3)
Moldova	--	--	--	--	--	--
Morocco	--	--	--	--	--	--
Netherlands	3 (1.3)	17 (4.5)	15 (5.1)	24 (5.1)	25 (4.8)	17 (4.9)
New Zealand	0 (0.0)	0 (0.0)	7 (2.1)	67 (3.5)	3 (1.6)	22 (3.3)
Philippines	2 (1.2)	2 (1.1)	8 (2.3)	30 (3.7)	1 (0.8)	57 (4.3)
Romania	30 (4.6)	30 (4.4)	0 (0.0)	19 (3.2)	21 (3.2)	0 (0.0)
Russian Federation	--	--	--	--	--	--
Singapore	1 (0.0)	1 (0.0)	24 (4.1)	62 (4.4)	5 (2.0)	7 (2.4)
Slovak Republic	6 (2.3)	21 (3.8)	1 (0.8)	6 (2.4)	19 (4.0)	47 (4.4)
Slovenia	11 (2.7)	23 (3.6)	13 (2.8)	30 (3.9)	24 (3.2)	0 (0.0)
South Africa	--	--	--	--	--	--
Thailand	4 (1.8)	5 (1.7)	12 (2.9)	53 (4.5)	13 (2.4)	14 (3.3)
Tunisia	1 (1.0)	9 (2.6)	4 (1.7)	2 (1.1)	12 (2.7)	72 (4.0)
Turkey	4 (1.3)	11 (2.5)	7 (2.2)	45 (4.0)	27 (3.3)	5 (1.7)
United States	3 (1.0)	7 (1.4)	14 (2.2)	42 (2.9)	10 (2.0)	25 (2.9)
International Avg.	6 (0.3)	10 (0.5)	9 (0.4)	33 (0.6)	20 (0.6)	22 (0.5)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by teachers.

* Categories of topic coverage for geometry are based on combined responses to questions about the individual mathematics subtopics in the content area described in exhibit 5.15.

¹ For each topic in 5.15, teachers were asked if the topic was taught before this year, taught 1-5 periods this year, taught more than 5 periods this year, or not yet taught. Topics taught during this year, regardless if taught before this year, are included in this category.[‡] Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (-) indicates data are not available.

An "r" indicates teacher response data available for 70-84% of students. An "s" indicates teacher response data available for 50-69% of students.

	Percentage of Students					
	Taught Topics Before This Year Only		Taught Topics During This Year ¹			Not Yet Taught 50% or More of Topics
	More Than 80% of Topics	More Than 50% Up to and Including 80% of Topics	More Than 50% of Topics Each Taught More Than 5 Periods	More Than 50% of Topics Each Taught at Least 1-5 Periods	50% or Less of Topics Taught	
Australia	1 (0.9)	2 (1.2)	46 (4.9)	45 (4.9)	3 (1.5)	3 (1.6)
Belgium (Flemish) r	1 (0.7)	9 (1.9)	20 (2.9)	43 (3.6)	11 (2.1)	16 (3.2)
Bulgaria r	22 (3.6)	18 (4.1)	24 (4.6)	32 (6.3)	3 (1.5)	1 (0.5)
Canada r	1 (0.5)	1 (0.4)	54 (3.0)	38 (2.6)	0 (0.0)	6 (2.3)
Chile	0 (0.0)	1 (0.5)	31 (3.5)	35 (3.8)	2 (0.9)	32 (3.9)
Chinese Taipei	28 (3.6)	57 (4.0)	4 (1.7)	8 (2.1)	2 (1.1)	1 (0.0)
Cyprus r	0 (0.0)	3 (1.9)	29 (4.9)	65 (5.1)	3 (0.2)	0 (0.0)
Czech Republic	2 (1.2)	3 (1.5)	69 (5.0)	20 (4.4)	5 (2.4)	2 (1.7)
England s	0 (0.0)	8 (2.4)	21 (2.9)	60 (3.3)	4 (1.3)	7 (1.4)
Finland	0 (0.0)	1 (1.3)	10 (2.3)	32 (4.1)	4 (2.0)	52 (4.5)
Hong Kong, SAR	4 (1.6)	19 (3.3)	25 (4.0)	43 (3.9)	10 (2.7)	1 (0.0)
Hungary	11 (2.4)	18 (3.3)	40 (4.6)	29 (3.8)	2 (1.2)	0 (0.0)
Indonesia	3 (1.3)	8 (2.3)	21 (3.4)	58 (4.6)	7 (2.2)	3 (1.8)
Iran, Islamic Rep.	0 (0.0)	4 (1.5)	11 (2.8)	76 (4.1)	9 (3.9)	0 (0.0)
Israel	2 (0.8)	10 (2.2)	49 (3.5)	28 (3.5)	9 (2.2)	1 (0.9)
Italy	0 (0.0)	1 (0.0)	67 (3.7)	28 (3.3)	0 (0.0)	4 (1.5)
Japan	5 (2.3)	30 (4.2)	38 (3.9)	25 (4.0)	2 (1.1)	0 (0.0)
Jordan	1 (0.8)	14 (2.9)	15 (3.2)	43 (4.3)	21 (4.1)	6 (2.1)
Korea, Rep. of	5 (1.7)	9 (2.5)	36 (4.0)	48 (4.0)	1 (0.0)	1 (0.7)
Latvia (LSS)	6 (1.9)	8 (2.6)	58 (4.5)	28 (3.8)	0 (0.5)	0 (0.0)
Lithuania †	--	--	--	--	--	--
Macedonia, Rep. of r	2 (1.2)	46 (4.3)	14 (2.5)	23 (3.9)	11 (3.1)	4 (1.8)
Malaysia	1 (0.9)	0 (0.0)	29 (3.6)	68 (3.8)	0 (0.0)	1 (1.0)
Moldova	--	--	--	--	--	--
Morocco	--	--	--	--	--	--
Netherlands	1 (0.1)	2 (1.1)	32 (6.4)	34 (6.2)	12 (3.9)	19 (6.0)
New Zealand	0 (0.0)	0 (0.0)	35 (4.0)	56 (4.3)	0 (0.0)	8 (2.4)
Philippines	1 (0.6)	2 (1.2)	20 (3.6)	45 (4.3)	1 (0.6)	32 (3.8)
Romania	10 (2.7)	16 (3.5)	23 (3.6)	51 (4.2)	0 (0.0)	0 (0.0)
Russian Federation	--	--	--	--	--	--
Singapore	2 (1.1)	18 (3.4)	32 (3.9)	48 (4.8)	1 (1.0)	0 (0.0)
Slovak Republic	1 (1.0)	10 (3.2)	63 (4.8)	23 (3.6)	3 (1.5)	0 (0.0)
Slovenia	4 (1.6)	14 (3.1)	39 (4.1)	42 (4.6)	1 (1.0)	0 (0.0)
South Africa	--	--	--	--	--	--
Thailand	5 (1.7)	4 (1.2)	14 (3.0)	58 (4.2)	1 (1.0)	18 (3.6)
Tunisia r	8 (2.7)	21 (4.1)	20 (3.5)	4 (1.9)	13 (3.1)	33 (4.4)
Turkey	4 (1.4)	10 (2.6)	31 (3.7)	49 (3.5)	0 (0.0)	5 (1.7)
United States	3 (1.2)	0 (0.3)	62 (2.7)	32 (2.6)	0 (0.2)	2 (0.9)
International Avg.	4 (0.3)	11 (0.4)	33 (0.7)	40 (0.7)	4 (0.3)	8 (0.4)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by teachers.

* Categories of topic coverage for algebra are based on combined responses to questions about the individual mathematics subtopics in the content area described in exhibit 5.16.

¹ For each topic in 5.16, teachers were asked if the topic was taught before this year, taught 1-5 periods this year, taught more than 5 periods this year, or not yet taught. Topics taught during this year, regardless if taught before this year, are included in this category.

† Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (-) indicates data are not available.

An "r" indicates teacher response data available for 70-84% of students. An "s" indicates teacher response data available for 50-69% of students.