

Exhibit 12. Common U.S. and international topics for Population 2 mathematics. The U.S. composite mathematics curriculum as represented in state curriculum guides includes more topics at this grade level than does the international composite. The same is true for U.S. textbooks. This is true both for algebra course textbooks and those for more general mathematics courses. These latter may include some but not an entire course of algebra (although here called "nonalgebra textbooks"). U.S. textbooks include several topics not commonly included in state curriculum guides for the US. [This exhibit lists topics from the TIMSS' mathematics framework intended by at least 70 percent of the countries (international) or at least 70 percent of sampled state guides (U.S.) for the upper grade of Population 2 (U.S. grade 8). Bold-face labels are more general categories that subsume more specific (non-bold-face) topics. Both lists (U.S. and international) are arranged in three categories. These three are topics listed only in 70 percent of curriculum guides, topics listed in 70 percent of both curriculum guides and textbooks, and topics listed only in 70 percent of the textbooks. Asterisks mark topics receiving more extensive textbook attention.]

International	U.S.-Nonalgebra Textbooks	U.S.-Algebra Textbooks
CURRICULUM GUIDES (Not In Textbooks)		
Number Integer, Rational & Real Numbers Real Numbers, Their Subsets & Properties Geometry: Symmetry, Congruence & Similarity Congruence & Similarity Constructions Using Straightedge & Compass Proportionality Proportionality Concepts	Number Estimation & Number Sense Concepts Exponents & Orders of Magnitude Geometry: Position, Visualization & Shape Vectors	Number Estimation & Number Sense Concepts Estimating Quantity & Size Rounding & Significant Figures Estimating Computations Exponents & Orders of Magnitude Measurement Units Estimation & Errors Geometry: Position, Visualization & Shape 3-D Geometry Vectors
CURRICULUM GUIDES (Included in Textbooks)		
Number Integer, Rational & Real Numbers Integers & Their Properties Rational Numbers & Their Properties Other Numbers & Number Concepts Exponents, Roots & Radicals Measurement Perimeter, Area & Volume Geometry: Position, Visualization & Shape 2-D Geometry: Coordinate Geometry 2-D Geometry: Basics 2-D Geometry: Polygons & Circles 3-D Geometry Geometry: Symmetry, Congruence & Similarity Transformations Proportionality Proportionality Problems Functions, Relations, & Equations Patterns, Relations & Functions Equations & Formulas	Number Whole Numbers Operations Fractions & Decimals Common Fractions Relationship of Common & Decimal Fractions Percentages Integer, Rational & Real Numbers Integers & Their Properties Estimation & Number Sense Concepts Estimating Quantity & Size Rounding & Significant Figures Estimating Computations Measurement Units Perimeter, Area & Volume Estimation & Errors Geometry: Position, Visualization & Shape 2-D Geometry: Coordinate Geometry 2-D Geometry: Basics 2-D Geometry: Polygons & Circles 3-D Geometry Geometry: Symmetry, Congruence & Similarity Transformations Congruence & Similarity Proportionality Proportionality Concepts Functions, Relations, & Equations Patterns, Relations & Functions Equations & Formulas* Data Representation, Probability, & Statistics Data Representation & Analysis Uncertainty & Probability	Number Whole Numbers Operations Fractions & Decimals Common Fractions Relationship of Common & Decimal Fractions Percentages Integer, Rational & Real Numbers Integers & Their Properties Measurement Perimeter, Area & Volume Geometry: Position, Visualization & Shape 2-D Geometry: Coordinate Geometry* 2-D Geometry: Basics 2-D Geometry: Polygons & Circles Geometry: Symmetry, Congruence & Similarity Transformations Congruence & Similarity Proportionality Proportionality Concepts Functions, Relations, & Equations Patterns, Relations & Functions Equations & Formulas* Data Representation, Probability, & Statistics Data Representation & Analysis Uncertainty & Probability
EXCLUSIVELY IN TEXTBOOKS		
Number Whole Numbers Properties of Operations Fractions & Decimals Common Fractions Decimal Fractions Relationships of Common & Decimal Fractions Percentages Measurement Units	Number Whole Numbers Meaning Properties of Operations Fractions & Decimals Decimal Fractions Integer, Rational & Real Numbers Rational Numbers & Their Properties Real Numbers, Their Subsets & Properties Other Numbers & Number Concepts Binary arithmetic and/or Other Number Bases Exponents, Roots & Radicals Number Theory Counting Geometry: Symmetry, Congruence & Similarity Constructions Using Straightedge & Compass Proportionality Proportionality Problems Slope & Trigonometry Validation & Structure Validation and Justification Structuring and Abstracting Other Content	Number Whole Numbers Meaning Properties of Operations Fractions & Decimals Decimal Fractions Integer, Rational & Real Numbers Rational Numbers & Their Properties Real Numbers, Their Subsets & Properties* Other Numbers & Number Concepts Exponents, Roots & Radicals* Complex Numbers & Their Properties Number Theory Proportionality Proportionality Problems Slope & Trigonometry Validation & Structure Validation and Justification Structuring and Abstracting Other Content