

Mathematics 7

General Curriculum Outcomes

- A. Students will demonstrate number sense and apply number-theory concepts.
- B. Students will demonstrate operation sense and apply operation principles and procedures in both numeric and algebraic situations.
- C. Students will explore, recognize, represent, and apply patterns and relationships, both informally and informally.
- D. Students will demonstrate an understanding of and apply concepts and skills associated with measurement.
- E. Students will demonstrate spatial sense and apply geometric concepts, properties, and relationships.
- F. Students will solve problems involving the collection, display, and analysis of data.
- G. Students will represent and solve problems involving uncertainty.

Specific Curriculum Outcomes

Students will be expected to

- A1 model and use power, base, and exponent to represent repeated multiplication
- A2 rename numbers among exponential, standard and expanded forms
- A3 rewrite large numbers from standard form to scientific notation and vice versa
- A4 solve and create problems involving common factors and greatest common factors (GCF)
- A5 solve and create problems involving common multiples and least common multiples (LCM)
- A6 develop and apply divisibility rules for 3, 4, 6, and 9
- A7 apply patterning in renaming numbers from fractions and mixed numbers to decimal numbers
- A8 rename single-digit and double-digit repeating decimals to fractions through the use of patterns, and use these patterns to make predictions
- A9 compare and order proper and improper fractions, mixed numbers, and decimal numbers
- A10 illustrate, explain, and express ratios, fractions, decimals, and percents in alternative forms
- A11 demonstrate number sense for percent
- A12 represent integers (including zero) concretely, pictorially, and symbolically, using a variety of models
- A13 compare and order integers

- B1 use estimation strategies to assess and justify the reasonableness of calculation results for integers and decimal numbers
- B2 use mental math strategies for calculations involving integers and decimal numbers
- B3 demonstrate understanding of the properties of operations with decimal numbers and integers
- B4 determine and use the most appropriate computational method in problem situations involving whole numbers and/or decimals
- B5 apply the order of operations for problems involving whole and decimal numbers
- B6 estimate sum or difference of fractions when appropriate
- B7 multiply mentally a fraction by whole numbers and vice versa
- B8 estimate and determine percent when given the part and the whole

- B9 estimate and determine the percent of a number
 - B10 create and solve problems that involve the use of percent
 - B11 add and subtract integers concretely, pictorially, and symbolically to solve problems
 - B12 multiply integers concretely, pictorially, and symbolically to solve problems
 - B13 divide integers concretely, pictorially, and symbolically to solve problems
 - B14 solve and pose problems that utilize addition, subtraction, multiplication, and division of integers
 - B15 apply the order of operations to integers
 - B16 create and evaluate simple variable expressions by recognizing that the four operations apply in the same way as they do for numerical expressions
 - B17 distinguish between like and unlike terms
 - B18 add and subtract like terms by recognizing the parallel with numerical situations, using concrete and pictorial models
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- C1 describe a pattern, using written and spoken language and tables and graphs
 - C2 summarize simple patterns, using constants, variables, algebraic expressions, and equations, and use them in making predictions
 - C3 explain the difference between algebraic expressions and algebraic equations
 - C4 solve one- and two-step single-variable linear equations, using systematic trial
 - C5 illustrate the solution for one- and two-step single-variable linear equations, using concrete materials and diagrams
 - C6 graph linear equations, using a table of values
 - C7 interpolate and extrapolate number values from a given graph
 - C8 determine if an ordered pair is a solution to a linear equation
 - C9 construct and analyze graphs to show how change in one quantity affects a related quantity
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- D1 identify, use, and convert among the SI units to measure, estimate, and solve problems that relate to length, area, volume, mass, and capacity
 - D2 apply concepts and skills related to time in problem situations
 - D3 develop and use rate as a tool for solving indirect measurement problems in a variety of contexts
 - D4 construct and analyze graphs of rates to show how change in one quantity affects a related quantity
 - D5 demonstrate an understanding of the relationships among diameter, radii, and circumference of circles, and use the relationships to solve problems
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- E1 recognize, name, describe, and construct polygons
 - E2 predict and generate polygons that can be formed with a transformation or composition of transformations of a given polygon
 - E3 make and apply generalizations about the properties of regular polygons
 - E4 make and apply generalizations about tessellations of polygons
 - E5 construct polyhedra using one type of regular polygonal face, and describe and name the resulting Platonic Solids
 - E6 construct semi-regular polyhedra and describe and name the resulting solids, and demonstrate an understanding about their relationships to the Platonic Solids
 - E7 make and apply generalizations about angle relationships
 - E8 make and apply generalizations about the commutativity of transformations
 - E9 make and apply informal deductions about the minimum and sufficient conditions to guarantee that a given triangle is of a particular type

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- E10 make informal deductions about the minimum and sufficient conditions to guarantee that a given quadrilateral is of a particular type and to understand formal definitions of the various members of the quadrilateral family

 - F1 communicate through example the distinction between biased and unbiased sampling, and first- and second-hand data
 - F2 formulate questions for investigation from relevant contexts
 - F3 select, defend, and use appropriate data collection methods and evaluate issues to be considered when collecting data
 - F4 construct a histogram
 - F5 construct appropriate data displays, grouping data where appropriate and taking into consideration the nature of the data
 - F6 read and make inferences for grouped and ungrouped data displays
 - F7 formulate statistics projects to explore current issues from within mathematics, other subject areas, or the world of students
 - F8 determine measures of central tendency and how they are affected by data presentations and fluctuations
 - F9 draw inferences and make predictions based on the variability of data sets, using range and the examination of outliers, gaps, and clusters

 - G1 identify situations for which the probability would be near 0, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, and 1
 - G2 solve probability problems, using simulations and by conducting experiments
 - G3 identify all possible outcomes of two independent events, using tree diagrams and area models
 - G4 create and solve problems, using the numerical definition of probability
 - G5 compare experimental results with theoretical results
 - G6 use fractions, decimals, and per cents as numerical expressions to describe probability