

Grade 7 Mathematics: Year at a Glance

Overview

Grade 7 mathematics is part of the curriculum. In Number, students deepen number sense by comparing and ordering fractions and decimals, adding and subtracting positive fractions and mixed numbers, working with all four operations on decimals, adding and subtracting integers, connecting repeating and terminating decimals to fractions, solving percent problems, and explaining divisibility rules. Patterns and Relations asks students to describe patterns and linear relations, build and graph tables of values, explain the difference between an expression and an equation, evaluate expressions, and model and solve one-step and multi-step linear equations. Shape and Space covers three areas: measurement, where students explore circles, circumference and pi, and develop area formulas for triangles, parallelograms and circles; transformations, where students plot points in all four quadrants of the Cartesian plane and perform translations, rotations and reflections; and 3-D objects and 2-D shapes, where students carry out geometric constructions such as perpendicular and parallel line segments and angle bisectors. Statistics and Probability has students identify sample spaces and compare theoretical and experimental probability for two independent events, and separately collect and analyze data through measures of central tendency, the effect of outliers, and circle graphs. [See the curriculum: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42.](#)

The year at a glance

Grade 7

Unit	General outcomes	Specific outcomes
Shape and Space (Measurement)	Use direct and indirect measurement to solve problems.	Demonstrate an understanding of circles by: - describing the relationships among radius, diameter and circumference - relating circumference to pi - determining the sum of the central angles - constructing circles with a given radius or... (see the curriculum); Develop and apply a formula for determining the area of: - triangles - parallelograms - circles. (see the curriculum)
Patterns and Relations (Patterns)	Use patterns to describe the world and to solve problems.	Demonstrate an understanding of oral and written patterns and their equivalent linear relations. (see the curriculum); Create a table of values from a linear relation, graph the table of values, and analyze the graph to draw conclusions and solve problems. (see the curriculum)

Statistics and Probability (Chance and Uncertainty)	Use experimental or theoretical probabilities to represent and solve problems involving uncertainty.	Identify the sample space (where the combined sample space has 36 or fewer elements) for a probability experiment involving two independent events. (see the curriculum); Express probabilities as ratios, fractions and percents. (see the curriculum); Conduct a probability experiment to compare the theoretical probability (determined using a tree diagram, table or other graphic organizer) and experimental probability of two independent events. (see the curriculum)
Shape and Space (Transformations)	Describe and analyze position and motion of objects and shapes.	Identify and plot points in the four quadrants of a Cartesian plane, using integral ordered pairs. (see the curriculum); Perform and describe transformations (translations, rotations or reflections) of a 2-D shape in all four quadrants of a Cartesian plane (limited to integral number vertices). (see the curriculum)
Shape and Space (3-D Objects and 2-D Shapes)	Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them.	Perform geometric constructions, including: - perpendicular line segments - parallel line segments - perpendicular bisectors - angle bisectors. (see the curriculum)
Patterns and Relations (Variables and Equations)	Represent algebraic expressions in multiple ways.	Evaluate an expression, given the value of the variable(s). (see the curriculum); Demonstrate an understanding of preservation of equality by: - modelling preservation of equality, concretely, pictorially and symbolically - applying preservation of equality to solve equations. (see the curriculum); Model and solve, concretely, pictorially and symbolically, problems that can be represented by one-step linear equations of the form $x + a = b$, where a and b are integers. (see the curriculum); Explain the difference between an expression and an equation. (see the curriculum); Model and solve, concretely, pictorially and symbolically, problems that can be represented by linear equations of the form: - ... (see the curriculum)

Statistics and Probability (Data Analysis)	Collect, display and analyze data to solve problems.	Demonstrate an understanding of central tendency and range by: - determining the measures of central tendency (mean, median, mode) and range - determining the most appropriate measures of central tendency to report findings. (see the curriculum); Construct, label and interpret circle graphs to solve problems. (see the curriculum); Determine the effect on the mean, median and mode when an outlier is included in a data set. (see the curriculum)
Number	Develop number sense.	Compare and order positive fractions, positive decimals (to thousandths) and whole numbers by using: - benchmarks - place value - equivalent fractions and/or decimals. (see the curriculum); Demonstrate an understanding of adding and subtracting positive fractions and mixed numbers, with like and unlike denominators, concretely, pictorially and symbolically (limited to positive sums and differences). (see the curriculum); Demonstrate an understanding of the addition, subtraction, multiplication and division of decimals to solve problems (for more than 1-digit divisors or 2-digit multipliers, the use of technology is expected). (see the curriculum); Demonstrate an understanding of addition and subtraction of integers, concretely, pictorially and symbolically. (see the curriculum); Demonstrate an understanding of the relationship between positive terminating decimals and positive fractions and between positive repeating decimals and positive fractions. (see the curriculum); Determine and explain why a number is divisible by 2, 3, 4, 5, 6, 8, 9 or 10, and why a number cannot be divided by 0. (see the curriculum); Solve problems involving percents from 1% to 100%. (see the curriculum)

Across the year

- Work with fractions, decimals, integers and percents in the Number strand supports every equation and expression students evaluate in Patterns and Relations. [See the curriculum: 1, 2, 3, 4.](#)
- Plotting points in the four quadrants for transformations uses the same Cartesian plane skills students apply when graphing tables of values for linear relations. [See the curriculum: 1, 2.](#)

- Probability outcomes ask students to express results as ratios, fractions and percents, tying probability work directly back to Number strand skills. [See the curriculum: 1, 2.](#)
- Circle work appears twice in different strands: once as a measurement topic involving circumference and area, and again as a way to display data in circle graphs. [See the curriculum: 1, 2, 3.](#)
- Central tendency and outlier work in Data Analysis draws on the same decimal and whole number operations developed in the Number strand. [See the curriculum: 1, 2, 3.](#)