

## Mathematics Grade 8

### Concepts and Principles of Measurement

1. Select and use appropriate units and tools to make formal measurements in both (metric and customary) systems.
2. Convert units of measurement within each system in problem solving situations.

### Data Analysis, Probability, and Statistics

1. Analyze and interpret tables, charts, and graphs, including frequency tables, scatter plots, broken line graphs, line plots, bar graphs, histograms, circle graphs, and stem-and-leaf plots.
2. Explain and justify conclusions drawn from tables, charts, and graphs.
3. Choose and calculate the appropriate measure of central tendency – mean, median, and mode.

### Number and Operation

1. Compare magnitudes and relative magnitudes of rational numbers, including absolute values.
2. Convert between standard form, scientific notation, and exponential form.
3. Apply number theory concepts (primes, composites, prime factorization, least common multiple, greatest common factor).
4. Evaluate numerical expressions with rational numbers using the order of operations.
5. Use a variety of strategies including common mathematical formulas to compute problems drawn from life situations.
6. Identify whether a given estimate is an overestimate or underestimate.

### Concepts and Language of Algebra and Functions

1. Use variables in expressions, equations, and inequalities.
2. Translate simple word statements and story problems into algebraic expressions and equations.
3. Use symbols to express relationships ( $<$ ,  $=$ ,  $>$ ,  $\neq$ ,  $\leq$ , and  $\geq$ ).
4. Use the order of operations in evaluating simple algebraic expressions.
5. Extend patterns and identify a rule that generates the pattern.
6. Use patterns and linear functions to represent and solve problems.

### Concepts and Principles of Geometry

1. Draw and measure various angles and shapes using appropriate tools.
2. Apply the fundamental concepts, properties, and relationships among points, lines, rays, planes, and angles.
3. Identify and model the effects of reflections, translations, rotations, and scaling on various shapes.

## Mathematical Reasoning (Not in Descartes)

1. Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.
2. Determine when and how to break a problem into simpler parts.
3. Use estimation to verify the reasonableness of calculated results
4. Apply strategies and results from simpler problems to more complex problems
5. Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models to explain mathematical reasoning
6. Make precise calculations and check the validity of the results from the context of the problem
7. Evaluate the reasonableness of the solution in the context of the original situation
8. Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems
9. Develop generalizations of the results obtained and apply them in other circumstances