National Evaluation Series

Test Framework

Essential Academic Skills
Subtest III: Mathematics (007)

December 2021

0001: Apply knowledge of number properties and operations.

- Demonstrate knowledge of place value, computational fluency, and reasonable estimation.
- Demonstrate knowledge of the order of operations.
- Apply addition, subtraction, multiplication, and division to solve multidigit computations with positive and negative integers, fractions, decimals, and percentages.
- Recognize and identify equivalent ways of representing integers, fractions, decimals, and percentages, including the use of exponents and scientific notation.
- Solve word problems involving integers, fractions, decimals, percentages, ratios, and proportions.

0002: Apply algebraic principles and concepts.

- Evaluate algebraic expressions by substituting numbers for variables.
- Identify and extend arithmetic and geometric patterns and sequences.
- Solve linear algebraic equations and inequalities involving one variable.
- Identify equivalent algebraic expressions.
- Graph ordered pairs and number relationships presented in tabular or symbolic form.
- Identify linear equations that accurately represent data presented in tabular or graphic form.

0003: Apply knowledge of measurement principles and geometric concepts.

- Identify the proper measurement tool or unit to solve a given problem.
- Solve problems involving the conversion of units within and between standard and metric measurement systems and calculate derived measurements.
- Solve problems involving scale, lines, line segments, and angles.
- Analyze and identify fundamental types and properties of two- and three-dimensional figures.
- Solve real-world problems involving basic measurement (e.g., length, perimeter, area) and geometric concepts, including the Pythagorean theorem.

0004: Apply knowledge of probability and statistics principles and concepts.

- Calculate and evaluate the probability of a specific event and/or outcome.
- Analyze data presented in various formats (e.g., tables, line graphs, scatter plots, pictographs, bar graphs, histograms, pie charts, box-and-whisker plots).
- Demonstrate knowledge of the appropriate ways to collect, organize, and represent data.
- Calculate and interpret the mean, median, and mode of a set of data.
- Demonstrate knowledge of the concepts of range, standard deviation, and spread.
- Recognize appropriate and inappropriate uses of basic statistics, such as making predictions and/or influencing decisions.

0005: Analyze mathematical problem-solving, reasoning, and communication skills.

- Evaluate whether a solution to a given computation or problem is reasonable.
- Use algorithms (i.e., a set of instructions) to perform a given calculation or solve a problem.
- Apply inductive reasoning to identify missing terms in numerical and graphical patterns.
- Apply deductive reasoning to draw conclusions, evaluate arguments, and make predictions.
- Apply, and translate between, the various forms of mathematical communication (e.g., mathematical terminology, equations, diagrams, graphs).