



Test Framework

Elementary Education Subtest II with Numeracy (114)

February 2025

Content Domain	Range of Competencies	Approximate Percentage of Test Score
I. Numeracy	0001–0002	25%
II. Algebra, Geometry, Measurement, and Data Analysis	0003–0004	25%
III. Science	0005–0007	30%
IV. The Arts, Health, and Fitness	0008	20%

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NUMERACY**0001: Apply knowledge of numeracy by interpreting and reasoning about counts and operations with whole numbers.**

- Demonstrate knowledge of counting principles (e.g., ordinality, cardinality, number sequence, hierarchical inclusion, one-to-one correspondence), assess evidence of student understanding of these principles, and identify how counting principles relate to the content and purpose of instructional activities.
- Demonstrate knowledge of quantity, place value, units, and regrouping in the base-10 number system and interpret multiple representations of the base-10 number system (e.g., base-10 blocks, drawings, verbal descriptions).
- Demonstrate knowledge of the addition and subtraction of whole numbers to analyze relationships, representations, and mathematical strategies (e.g., decompositions, anchor numbers, counting on, compensation) in order to solve problems.
- Demonstrate knowledge of the multiplication and division of whole numbers to analyze relationships, representations, and mathematical strategies (e.g., fact families, fluency, area models) in order to solve problems.
- Demonstrate knowledge of the properties of arithmetic (e.g., associative, distributive) and relationships among arithmetic operations (e.g., division as repeated subtraction, multiplication as a sum of partial products).
- Analyze and solve problems involving multiple operations with whole numbers, including problems that involve estimation.
- Analyze evidence of mathematical thinking (e.g., work samples, drawings, discussion excerpts) related to counts and whole-number operations and use this evidence to evaluate claims about a student's understanding, including when the student's understanding is incorrect or partially correct (e.g., analyzing mathematical errors).
- Demonstrate knowledge of developmentally appropriate instructional strategies (e.g., moving from concrete to abstract reasoning) that address students' misconceptions and mathematical errors related to counts and operations with whole numbers.
- Demonstrate knowledge of developmentally appropriate instructional strategies that use differentiation and targeted instruction to meet students' needs and that promote flexible reasoning across multiple solution pathways.

- Demonstrate knowledge of developmentally appropriate instructional strategies that promote students' skills in collaboration, discourse, and comprehension of real-world scenarios that relate to counts and operations with whole numbers.
- Demonstrate knowledge of developmentally appropriate instructional strategies that promote students' use of precision in their work (e.g., vocabulary, discussions, solution strategies, computations, modeling).

0002: Apply knowledge of numeracy by interpreting and reasoning about fractions, decimals, percentages, ratios, and proportions.

- Apply knowledge of relationships that are expressed with fractions and analyze representations of quantities involving fractions (e.g., fraction strips, area representations).
- Demonstrate knowledge of how methods for performing arithmetic operations apply to fractional quantities, reason flexibly with fraction operations and their representations, and solve problems involving fractions.
- Demonstrate understanding of decimals in the base-10 number system and their representations and solve problems involving decimals.
- Compare numbers written as fractions, decimals, and percentages and analyze strategies for comparing those quantities.
- Demonstrate understanding of ratios and proportional relationships, reason flexibly with proportions and their representations, and solve problems involving ratios and proportions.
- Analyze and solve problems involving multiple operations with fractions, decimals, percentages, ratios, or proportions, including problems that involve estimation.
- Identify the mathematical features, affordances, and limitations of a particular representation or solution strategy that involves operations with fractions, decimals, percentages, ratios, or proportions.
- Analyze evidence of mathematical thinking (e.g., work samples, drawings, discussion excerpts) related to fractions, decimals, percentages, ratios, and proportions and use this evidence to evaluate claims about a student's understanding, including when the student's understanding is incorrect or partially correct (e.g., analyzing mathematical errors).
- Demonstrate knowledge of developmentally appropriate instructional strategies (e.g., moving from concrete to abstract reasoning) that address students' misconceptions and mathematical errors related to fractions, decimals, percentages, ratios, and proportions.

- Demonstrate knowledge of developmentally appropriate instructional strategies that use differentiation and targeted instruction to meet students' needs and that promote flexible reasoning across multiple solution pathways.
- Demonstrate knowledge of developmentally appropriate instructional strategies that promote students' skills in collaboration, discourse, and comprehension of real-world scenarios that relate to fractions, decimals, percentages, ratios, and proportions.
- Demonstrate knowledge of developmentally appropriate instructional strategies that promote students' use of precision in their work (e.g., vocabulary, discussions, solution strategies, computations, modeling).

ALGEBRA, GEOMETRY, MEASUREMENT, AND DATA ANALYSIS

0003: Apply knowledge of mathematical operations, patterns, algebra, and functions.

- Solve problems involving integers, rational numbers, exponents, and scientific notation.
- Apply and connect concepts such as factor, prime, divisor, and multiple to particular numbers and sets of numbers.
- Recognize patterns in numbers, shapes, and data and ways to use variables, expressions, equations, and inequalities to communicate quantitative relationships.
- Apply knowledge of patterns to model real-world situations and make predictions.
- Recognize types and properties of functions.
- Apply knowledge of various strategies and procedures in solving equations and real-world problems using patterns, algebra, and functions.
- Interpret and apply knowledge of verbal descriptions and mathematical language and symbols to express quantitative relationships and solve problems involving patterns, algebra, and functions.
- Interpret and apply knowledge of a variety of diagrams, models, charts, manipulatives, and other tools used to represent mathematical concepts and real-world situations using patterns, algebra, and functions.

0004: Apply knowledge of geometry, measurement, and data analysis.

- Recognize types and properties of lines, angles, and two- and three-dimensional shapes, including symmetry, congruence, and similarity.

- Solve problems involving perimeter, area, volume, geometric transformations, measurement, scale, and coordinate systems.
- Identify and use appropriate measurement units, tools, and techniques in various situations.
- Apply knowledge of statistical measures (e.g., mean, median, mode, range, standard deviation) to describe and analyze data.
- Convert measurements within and between the metric and customary systems.
- Apply knowledge of various strategies and procedures in solving real-world problems using geometry, measurement, and data analysis.
- Interpret and apply knowledge of verbal descriptions and mathematical language and symbols to express quantitative relationships and solve problems involving geometry, measurement, and data analysis.
- Interpret and apply knowledge of a variety of diagrams, models, charts, manipulatives, and other tools used to represent mathematical concepts and real-world situations using geometry, measurement, and data analysis.
- Apply knowledge of basic concepts of probability, including the use of simulations and counting procedures to estimate probabilities.

SCIENCE

0005: Apply knowledge of the life sciences.

- Apply knowledge of the characteristics and life processes of plants, animals, and other living organisms.
- Demonstrate knowledge of the multiple ways in which organisms are ordered and classified and how species change over time.
- Recognize the life cycles and reproductive patterns of common organisms.
- Apply knowledge of the basic principles of heredity to the transmission of traits from one generation to the next.
- Analyze the interactions between organisms and their environment and the characteristics of and interactions between populations of organisms in an ecosystem.
- Apply knowledge of science and engineering practices to the life sciences.

- Apply knowledge of crosscutting concepts (i.e., patterns; cause and effect; scale, portion, and quantity; systems and system models; energy and matter; structure and function; and stability and change) to the life sciences.

0006: Apply knowledge of Earth and space sciences.

- Recognize types and characteristics of objects in the solar system and universe and the effects of the relative positions and motions of the sun, Earth, and moon.
- Apply knowledge of the composition, structure, landforms, and processes of Earth's geologic system and how this system interacts with other Earth systems.
- Apply knowledge of the composition, structure, and processes of Earth's hydrologic and atmospheric systems, including weather and climate, and how these systems interact with each other and with Earth's geologic system.
- Identify types and characteristics of renewable and nonrenewable natural resources and their uses and management.
- Apply knowledge of science and engineering practices to Earth and space sciences.
- Apply knowledge of crosscutting concepts (i.e., patterns; cause and effect; scale, portion, and quantity; systems and system models; energy and matter; structure and function; and stability and change) to Earth and space sciences.

0007: Apply knowledge of the physical sciences.

- Demonstrate knowledge of the composition, structure, and properties of matter and the difference between physical and chemical changes in matter.
- Recognize the effects of various types of forces (e.g., friction, gravity, magnetism) on objects in given situations.
- Apply knowledge of the properties and uses of simple machines and tools.
- Apply knowledge of the properties of light, sound, electricity, and magnetism.
- Recognize forms of energy, energy sources, and processes of energy transfer and transformations.
- Apply knowledge of science and engineering practices to the physical sciences.
- Apply knowledge of crosscutting concepts (i.e., patterns; cause and effect; scale, portion, and quantity; systems and system models; energy and matter; structure and function; and stability and change) to the physical sciences.

THE ARTS, HEALTH, AND FITNESS**0008: Apply knowledge of the arts and fundamental concepts of health and fitness.**

- Identify basic terms and elements associated with music, drama, dance, and the visual arts.
- Recognize basic techniques, tools, and processes for creating and performing works in the various arts.
- Demonstrate knowledge of the ways the arts can be used as a form of communication, self-expression, and social expression and the relationships between the arts, other content areas, and everyday life.
- Identify the basic structures and functions of the human body, common diseases, and illnesses and how to prevent or treat them.
- Demonstrate knowledge of developmentally appropriate relationships and interactions with others (e.g., peers, teachers, parents/guardians, caregivers, families).
- Apply knowledge of principles, practices, and skills for maintaining physical, mental, and emotional health and safety for reducing health risks.
- Identify the components of health-related fitness, developmental milestones, and appropriate activities for promoting the development of locomotor, nonlocomotor, manipulative, and perceptual awareness skills in students.
- Apply knowledge of nutritional principles that influence health and development and the relationships between health and fitness, other content areas, and everyday life.