ELEMENTARY EDUCATION SUBTEST II

Test Framework

	Content Domain	Range of Competencies	Approximate Percentage of Test Score
I.	Mathematics	0001–0004	50%
II.	Science	0005–0007	38%
III.	The Arts, Health, and Fitness	0008	12%

I. MATHEMATICS

0001 Understand concepts of numeration, number sense, and mathematical operations.

- Demonstrate knowledge of properties of numbers and number systems, operations, place value, rounding, comparing and ordering numbers, and equivalent representations of numbers.
- Use a variety of models to represent numbers and operations.
- Demonstrate knowledge of prime and composite numbers, divisibility rules, least common multiple, and greatest common factor.
- Solve problems involving integers, rational numbers, fractions, decimals, ratios, proportions, percent, exponents, and scientific notation.
- Apply knowledge of basic concepts of probability, including the use of simulations and counting procedures to estimate probabilities.
- Demonstrate knowledge of computation, including the use of mental math and estimation.

0002 Understand mathematical reasoning and problem solving, communication and representation, and data analysis.

- Demonstrate knowledge of mathematical reasoning and proofs.
- Apply knowledge of various strategies and procedures used in problem-solving situations.
- Translate between verbal descriptions and mathematical language and symbols to express quantitative relationships and to solve problems.
- Apply knowledge of a variety of diagrams, models, charts, manipulatives, and other tools used to represent mathematical concepts and real-world situations.
- Apply knowledge of statistical measures (e.g., mean, median, mode, range, frequency distribution) to describe and analyze data.
- Apply knowledge of data interpretation and of methods for displaying data in a variety of formats.

0003 Understand basic concepts of patterns, algebra, and functions.

- 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.
- Use algebraic concepts to solve equations and real-world problems.

0004 Understand basic concepts of geometry and measurement.

- 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.
- Use geometric concepts to solve real-world problems.
- Identify and use appropriate measurement units, tools, and measurement techniques in various situations.
- Convert measurements within the metric and customary systems.

II. SCIENCE

0005 Understand fundamental concepts 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 and the application of 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 ecological community.

0006 Understand fundamental concepts of the physical, Earth, and space 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 on objects in given situations and 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.
- 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 it 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, their uses, and their management.

0007 Understand the nature of science and the processes of scientific inquiry.

- Recognize the basic tenets, goals, and values of science and how scientific knowledge develops and changes over time.
- Recognize connections between and unifying themes among the life sciences, physical sciences, and Earth and space sciences, including the relationship between form and function, the nature of cycles and systems, the conservation of energy and matter, the use of models, and ways to organize and classify information.
- Apply knowledge of the scientific method, including the design of scientific investigations, systematic observation, and controlled experimentation.
- Apply knowledge of strategies for collecting, measuring, recording, summarizing, analyzing, and representing scientific data.
- Analyze the relationships between science, mathematics, technology, and society.

III. The Arts, Health, and Fitness

0008 Understand basic elements 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 connections between the art disciplines, other disciplines, and everyday life.
- Identify the basic structures and functions of the human body, common diseases and illnesses and how to prevent or treat them, and nutritional principles that influence health and development.
- Apply knowledge of principles, practices, and skills for maintaining physical, mental, and emotional health and safety and for reducing health risks.
- Identify the components of health-related fitness and appropriate activities to promote the development of locomotor, nonlocomotor, manipulative, and perceptual awareness skills in children.