

Texas Educator Certification Examination Program

Field 481: Core Subjects EC–6 Mathematics

Examination Framework

DRAFT

Domain	Range of Competencies
II. Mathematics	001–006

Copyright © 2024 Pearson Education Inc. or its affiliate(s). All rights reserved.
Pearson, 300 Venture Way, Hadley, MA 01035

Pearson and its logo are trademarks in the U.S. and/or other countries of Pearson Education, Inc., or its affiliates.

This draft includes some materials that are test secure and/or confidential.
It should not be circulated to unauthorized persons.

**481: CORE SUBJECTS EC–6 MATHEMATICS
EXAMINATION FRAMEWORK**

DOMAIN II—MATHEMATICS

Competency 001 (Mathematical Process Standards): *Apply knowledge of evidence-based and research-based instructional practices, strategies, and activities for developing students' knowledge and understanding of demonstrating mathematical concepts and real-world situations using the mathematical process standards, as described in the Texas Prekindergarten Guidelines and the Texas Essential Knowledge and Skills (TEKS) for Mathematics (Kindergarten through Grade 6).*

For example:

- A. Demonstrate knowledge of how to promote students' understanding of applying mathematics to problems arising in everyday life, society, and the workplace.
- B. Demonstrate knowledge of how to promote students' understanding of using a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
- C. Demonstrate knowledge of how to promote students' understanding of selecting tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
- D. Demonstrate knowledge of how to promote students' understanding of communicating mathematical ideas and reasoning using multiple representations, including symbols, diagrams, graphs, and language as appropriate.
- E. Demonstrate knowledge of how to promote students' understanding of creating and using representations to organize, record, and communicate mathematical ideas.
- F. Demonstrate knowledge of how to promote students' understanding of analyzing mathematical relationships to connect and communicate mathematical ideas.
- G. Demonstrate knowledge of how to promote students' understanding of how to use precise mathematical language in written or oral communication to display, explain, and justify mathematical ideas and arguments.

Copyright © 2024 Pearson Education, Inc. or its affiliate(s). All rights reserved.
Pearson, 300 Venture Way, Hadley, MA 01035

This draft includes some materials that are test secure and/or confidential.
It should not be circulated to unauthorized persons.

**481: CORE SUBJECTS EC–6 MATHEMATICS
EXAMINATION FRAMEWORK**

Competency 002 (Number and Operations): *Apply knowledge of evidence-based and research-based instructional practices, strategies, and activities for developing students' knowledge and demonstration of representing and comparing whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system, as described in the Texas Prekindergarten Guidelines and the Texas Essential Knowledge and Skills (TEKS) for Mathematics (Kindergarten through Grade 6), to more effectively connect and communicate mathematical ideas.*

For example:

- A. Demonstrate knowledge of how to promote students' understanding of counting with and without objects, one-to-one correspondence, cardinality, number sequencing, and subitizing; recognizing numerals, integers, and rational numbers; and representing numbers with objects, pictures, and symbols.
- B. Demonstrate knowledge of how to promote students' understanding of composing and decomposing numbers, describing and analyzing the mathematical relationships found in the base-10 place-value system, using mathematical language and symbols to compare numbers and expressions, and representing numbers in various forms (e.g., expanded, word, standard).
- C. Apply knowledge of how to promote students' demonstration of fluency, automaticity, skip-counting, and mental math.
- D. Demonstrate knowledge of how to promote students' understanding of using a number line to locate numbers, name points, round, and estimate to solve problems.
- E. Demonstrate knowledge of how to promote students' understanding of basic operations, properties of operations, and strategies for solving equations with all four operations, including interpreting remainders and using arrays and area models.
- F. Demonstrate knowledge of how to promote students' understanding of portioning objects into equal parts; representing parts, wholes, and benchmarks with fractions, percents, and decimals; and recognizing and solving for equivalent fractions.
- G. Demonstrate knowledge of how to promote students' understanding of identifying U.S. coins and representing money in decimal form, recognizing equivalence, and solving equations and real-world situations involving money.
- H. Apply knowledge of how to use and interpret the results of formative and summative assessments to understand students' thinking, identify strengths and progress toward mastery, and identify and respond to gaps in knowledge and understanding related to number and operations.
- I. Apply knowledge of key factors to consider in planning and delivering differentiated and explicit instruction, scaffolding, interventions, and flexible grouping to address the assessed strengths and needs of all students in number and operations.

Copyright © 2024 Pearson Education, Inc. or its affiliate(s). All rights reserved.
Pearson, 300 Venture Way, Hadley, MA 01035

This draft includes some materials that are test secure and/or confidential.
It should not be circulated to unauthorized persons.

**481: CORE SUBJECTS EC–6 MATHEMATICS
EXAMINATION FRAMEWORK**

Competency 003 (Algebraic Reasoning): *Apply knowledge of evidence-based and research-based instructional practices, strategies, and activities for developing students' knowledge and demonstration of analyzing patterns within properties of numbers and operations to describe relationships and develop concepts of expressions, equations, and proportionality, as described in the Texas Prekindergarten Guidelines and the Texas Essential Knowledge and Skills (TEKS) for Mathematics (Kindergarten through Grade 6).*

For example:

- A. Demonstrate knowledge of how to promote students' understanding of recognizing, duplicating, extending, and creating patterns and of identifying prime and composite numbers.
- B. Demonstrate knowledge of how to promote students' understanding of symbols used in equations and expressions (e.g., =, +, −, ÷, ×) and how they relate to solving equations and simplifying expressions.
- C. Demonstrate knowledge of how to promote students' understanding of generating numerical patterns when given an input/output table, rule, and/or graph; representing mathematical and real-world problems involving ratio and rate using scale factors, tables, graphs, and proportions; and representing ratios, rates, and percents with concrete models, fractions, and decimals.
- D. Demonstrate knowledge of how to promote students' understanding of relationships involving independent and dependent quantities, including representing a relationship using verbal descriptions, tables, graphs, and mathematical equations.
- E. Demonstrate knowledge of how to promote students' understanding of whether equations are true and expressions are equivalent using various methods; generating equivalent expressions using the properties of operations; and writing and representing solutions for equations and inequalities in mathematical and real-world situations.
- F. Demonstrate knowledge of how to promote students' understanding of generating formulas, including formulas for perimeter, area, and volume.
- G. Apply knowledge of how to use and interpret the results of formative and summative assessments to understand students' thinking, identify strengths and progress toward mastery, and identify and respond to gaps in knowledge and understanding related to algebraic reasoning.
- H. Apply knowledge of key factors to consider in planning and delivering differentiated and explicit instruction, scaffolding, interventions, and flexible grouping to address the assessed strengths and needs of all students in algebraic reasoning.

**481: CORE SUBJECTS EC–6 MATHEMATICS
EXAMINATION FRAMEWORK**

Competency 004 (Geometry and Measurement): *Apply knowledge of evidence-based and research-based instructional practices, strategies, and activities for developing students' knowledge and demonstration of applying concepts of geometry and measurement; analyzing attributes of two-dimensional shapes and three-dimensional solids to develop generalizations about their properties; and selecting and using units to describe length and time, as described in the Texas Prekindergarten Guidelines and the Texas Essential Knowledge and Skills (TEKS) for Mathematics (Kindergarten through Grade 6).*

For example:

- A. Demonstrate knowledge of how to promote students' understanding of using geometric language to describe, classify, compare, and sort regular and irregular two- and three-dimensional objects and polygons by their attributes (e.g., lines, sides, angles), and of using manipulatives to compose and decompose two- and three-dimensional shapes as well as partition them into equal parts.
- B. Demonstrate knowledge of how to promote students' understanding of the appropriate tools for measuring length, height, weight, mass, volume, and capacity; using different units to measure similar objects and distances and compare the length, height, and weight of people and objects; identifying various metric and customary measurements and converting within each system; and the inverse relationship between the size of units and number of units needed to measure a distance.
- C. Demonstrate knowledge of how to promote students' understanding of using measurement tools to model area formulas, write equations, decompose polygons, and determine solutions for problems involving the area and perimeter of rectangles, parallelograms, trapezoids, and triangles; measuring angles of triangles; and identifying the relationship between the sides and angles in a triangle.
- D. Demonstrate knowledge of how to promote students' understanding of identifying lines, line segments, rays, parallel and perpendicular lines, and lines of symmetry, as well as how they are used in the formation and measurement of geometric figures.
- E. Demonstrate knowledge of how to promote students' understanding of using language to describe passing of time within a day; reading and telling time on analog and digital clocks using pictorial models or tools; and solving problems involving addition and subtraction of time intervals.
- F. Demonstrate knowledge of how to promote students' understanding of solving mathematical and real-world measurement problems involving time, length, height, weight, mass, area, volume, capacity, and money using all four operations.
- G. Apply knowledge of how to promote students' knowledge of identifying key attributes of coordinate planes, demonstrating the process for graphing ordered pairs in all four quadrants, and graphing solutions to problems.
- H. Apply knowledge of how to use and interpret the results of formative and summative assessments to understand students' thinking, identify strengths and progress toward mastery, and identify and respond to gaps in knowledge and understanding related to geometry and measurement.
- I. Apply knowledge of key factors to consider in planning and delivering differentiated and explicit instruction, scaffolding, interventions, and flexible grouping to address the assessed strengths and needs of all students in geometry and measurement.

Copyright © 2024 Pearson Education, Inc. or its affiliate(s). All rights reserved.
Pearson, 300 Venture Way, Hadley, MA 01035

This draft includes some materials that are test secure and/or confidential.
It should not be circulated to unauthorized persons.

**481: CORE SUBJECTS EC–6 MATHEMATICS
EXAMINATION FRAMEWORK**

Competency 005 (Data Analysis): *Apply knowledge of evidence-based and research-based instructional practices, strategies, and activities for developing students' knowledge and demonstration of collecting, organizing, and displaying data and using data to interpret information to solve and analyze problems, as described in the Texas Prekindergarten Guidelines and the Texas Essential Knowledge and Skills (TEKS) for Mathematics (Kindergarten through Grade 6).*

For example:

- A. Demonstrate knowledge of how to promote students' understanding of collecting, sorting, and organizing data into categories, and of analyzing and arranging categorical and numerical data to create visual models or representations (e.g., graphs, tally marks, T-charts, dot plots).
- B. Demonstrate knowledge of how to promote students' understanding of analyzing graphs to make predictions and draw conclusions; interpreting data and graphs to write and solve one-step and two-step word problems using all four operations; and using graphs to summarize a data set with multiple categories.
- C. Demonstrate knowledge of how to promote students' understanding of solving one-step and two-step problems using whole numbers, fractions, and decimals in various tables and plots in mathematical and real-world situations.
- D. Demonstrate knowledge of how to promote students' understanding of analyzing the graphical representation of numerical data to describe the center, spread, and shape of a data distribution; summarizing and interpreting categorical data and graphical summaries, including measures of central tendency (mean, median, mode, range), percent value, and relative frequency; and distinguishing between situations that yield data with and without variability.
- E. Apply knowledge of how to use and interpret the results of formative and summative assessments to understand students' thinking, identify strengths and progress toward mastery, and identify and respond to gaps in knowledge and understanding related to data analysis.
- F. Apply knowledge of key factors to consider in planning and delivering differentiated and explicit instruction, scaffolding, interventions, and flexible grouping to address the assessed strengths and needs of all students in data analysis.

**481: CORE SUBJECTS EC–6 MATHEMATICS
EXAMINATION FRAMEWORK**

Competency 006 (Analysis and Response): *In a written response, analyze and interpret qualitative and quantitative data from student work samples to identify a given student's strengths and needs, provide feedback to the student, and describe an instructional strategy that effectively addresses the student's identified strengths and needs.*

For example:

- A. Analyze and interpret formative and summative observational and assessment data for a given student to identify and accurately describe a significant strength or need that the student demonstrates related to a mathematics skill or objective.
- B. Select and accurately describe an effective instructional strategy, intervention, or enrichment to build on a student's identified strength or address a student's identified need in the mathematics skill or objective.
- C. Using evidence-based and research-based knowledge of instruction and mathematics, explain the effectiveness of the selected instructional strategy, intervention, or enrichment to build on a student's identified strength or address a student's identified need.
- D. Select and accurately describe a method of formative assessment to effectively monitor the student's progress toward the mathematics skill or objective.
- E. Explain how the specific learning skill or objective in mathematics can be integrated in other areas of the mathematics curriculum to support the generalization or enrichment of the mathematics skill or objective.

Copyright © 2024 Pearson Education, Inc. or its affiliate(s). All rights reserved.
Pearson, 300 Venture Way, Hadley, MA 01035

This draft includes some materials that are test secure and/or confidential.
It should not be circulated to unauthorized persons.