Grade 4 Mathematics Assessment

Eligible Texas Essential Knowledge and Skills

STAAR Grade 4 Mathematics Assessment

Mathematical Process Standards

These student expectations will not be listed under a separate reporting category. Instead, they will be incorporated into test questions across reporting categories since the application of mathematical process standards is part of each knowledge statement.

(4.1)   **Mathematical process standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to

    (A)   apply mathematics to problems arising in everyday life, society, and the workplace;

    (B)   use 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)   select 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)   communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;

    (E)   create and use representations to organize, record, and communicate mathematical ideas;

    (F)   analyze mathematical relationships to connect and communicate mathematical ideas; and

    (G)   display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

Reporting Category 1:
Numerical Representations and Relationships

The student will demonstrate an understanding of how to represent and manipulate numbers and expressions.

(4.2)　　**Number and operations.** The student applies mathematical process standards to represent, compare, and order whole numbers and decimals and understand relationships related to place value. The student is expected to

　　(A)　　interpret the value of each place-value position as 10 times the position to the right and as one-tenth of the value of the place to its left; *Supporting Standard*

　　(B)　　represent the value of the digit in whole numbers through 1,000,000,000 and decimals to the hundredths using expanded notation and numerals; *Readiness Standard*

　　(C)　　compare and order whole numbers to 1,000,000,000 and represent comparisons using the symbols >, <, or =; *Supporting Standard*

　　(D)　　round whole numbers to a given place value through the hundred thousands place; *Supporting Standard*

　　(E)　　represent decimals, including tenths and hundredths, using concrete and visual models and money; *Supporting Standard*

　　(F)　　compare and order decimals using concrete and visual models to the hundredths; *Supporting Standard*

　　(G)　　relate decimals to fractions that name tenths and hundredths; and *Readiness Standard*

　　(H)　　determine the corresponding decimal to the tenths or hundredths place of a specified point on a number line. *Supporting Standard*

(4.3)　　**Number and operations.** The student applies mathematical process standards to represent and generate fractions to solve problems. The student is expected to

　　(A)　　represent a fraction a/b as a sum of fractions $1/b$, where a and b are whole numbers and $b > 0$, including when $a > b$; *Supporting Standard*

(B)   decompose a fraction in more than one way into a sum of fractions with the same denominator using concrete and pictorial models and recording results with symbolic representations; ***Supporting Standard***

(C)   determine if two given fractions are equivalent using a variety of methods; ***Supporting Standard***

(D)   compare two fractions with different numerators and different denominators and represent the comparison using the symbols >, =, or <; and ***Readiness Standard***

(G)   represent fractions and decimals to the tenths or hundredths as distances from zero on a number line. ***Supporting Standard***

Reporting Category 2:
Computations and Algebraic Relationships

The student will demonstrate an understanding of how to perform operations and represent algebraic relationships.

(4.3)   **Number and operations.** The student applies mathematical process standards to represent and generate fractions to solve problems. The student is expected to

    (E)   represent and solve addition and subtraction of fractions with equal denominators using objects and pictorial models that build to the number line and properties of operations; and ***Readiness Standard***

    (F)   evaluate the reasonableness of sums and differences of fractions using benchmark fractions 0, 1/4, 1/2, 3/4, and 1, referring to the same whole. ***Supporting Standard***

(4.4)   **Number and operations.** The student applies mathematical process standards to develop and use strategies and methods for whole number computations and decimal sums and differences in order to solve problems with efficiency and accuracy. The student is expected to

    (A)   add and subtract whole numbers and decimals to the hundredths place using the standard algorithm; ***Readiness Standard***

    (B)   determine products of a number and 10 or 100 using properties of operations and place value understandings; ***Supporting Standard***

    (C)   represent the product of 2 two-digit numbers using arrays, area models, or equations, including perfect squares through 15 by 15; ***Supporting Standard***

    (D)   use strategies and algorithms, including the standard algorithm, to multiply up to a four-digit number by a one-digit number and to multiply a two-digit number by a two-digit number. Strategies may include mental math, partial products, and the commutative, associative, and distributive properties; ***Supporting Standard***

    (E)   represent the quotient of up to a four-digit whole number divided by a one-digit whole number using arrays, area models, or equations; ***Supporting Standard***

    (F)   use strategies and algorithms, including the standard algorithm, to divide up to a four-digit dividend by a one-digit divisor; ***Supporting Standard***

(G)　round to the nearest 10, 100, or 1,000 or use compatible numbers to estimate solutions involving whole numbers; and ***Supporting Standard***

(H)　solve with fluency one- and two-step problems involving multiplication and division, including interpreting remainders. ***Readiness Standard***

(4.5)　**Algebraic reasoning.** The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to

(A)　represent multi-step problems involving the four operations with whole numbers using strip diagrams and equations with a letter standing for the unknown quantity; and ***Readiness Standard***

(B)　represent problems using an input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship of the values in the resulting sequence and their position in the sequence. ***Readiness Standard***

Reporting Category 3:
Geometry and Measurement

The student will demonstrate an understanding of how to represent and apply geometry and measurement concepts.

(4.5)   **Algebraic reasoning.** The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to

    (D)   solve problems related to perimeter and area of rectangles where dimensions are whole numbers. ***Readiness Standard***

(4.6)   **Geometry and measurement.** The student applies mathematical process standards to analyze geometric attributes in order to develop generalizations about their properties. The student is expected to

    (A)   identify points, lines, line segments, rays, angles, and perpendicular and parallel lines; ***Supporting Standard***

    (B)   identify and draw one or more lines of symmetry, if they exist, for a two-dimensional figure; ***Supporting Standard***

    (C)   apply knowledge of right angles to identify acute, right, and obtuse triangles; and ***Supporting Standard***

    (D)   classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size. ***Readiness Standard***

(4.7)   **Geometry and measurement.** The student applies mathematical process standards to solve problems involving angles less than or equal to 180 degrees. The student is expected to

    (C)   determine the approximate measures of angles in degrees to the nearest whole number using a protractor; ***Readiness Standard***

    (D)   draw an angle with a given measure; and ***Supporting Standard***

    (E)   determine the measure of an unknown angle formed by two non-overlapping adjacent angles given one or both angle measures. ***Supporting Standard***

(4.8)   **Geometry and measurement.** The student applies mathematical process standards to select appropriate customary and metric units, strategies, and tools to solve problems involving measurement. The student is expected to

    (A)   identify relative sizes of measurement units within the customary and metric systems; ***Supporting Standard***

    (B)   convert measurements within the same measurement system, customary or metric, from a smaller unit into a larger unit or a larger unit into a smaller unit when given other equivalent measures represented in a table; and ***Supporting Standard***

    (C)   solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate. ***Readiness Standard***

Reporting Category 4:
Data Analysis and Personal Financial Literacy

The student will demonstrate an understanding of how to represent and analyze data and how to describe and apply personal financial concepts.

(4.9)   **Data analysis.** The student applies mathematical process standards to solve problems by collecting, organizing, displaying, and interpreting data. The student is expected to

    (A)   represent data on a frequency table, dot plot, or stem-and-leaf plot marked with whole numbers and fractions; and
        Readiness Standard

    (B)   solve one- and two-step problems using data in whole number, decimal, and fraction form in a frequency table, dot plot, or stem-and-leaf plot. *Supporting Standard*

(4.10)   **Personal financial literacy.** The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to

    (A)   distinguish between fixed and variable expenses;
        Supporting Standard

    (B)   calculate profit in a given situation; and *Supporting Standard*

    (E)   describe the basic purpose of financial institutions, including keeping money safe, borrowing money, and lending. *Supporting Standard*