

# Texas Essential Knowledge and Skills for Mathematics Correlation to Project M<sup>3</sup> – Level 4-5

## 111.6. Grade 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.

Each lesson addresses these standards through the following:

- In-depth investigations and games
- Questioning strategies, including who, what, when, where, why and how questions
- Oral and written mathematical communication and argumentation
  - Think Deeply questions
  - Talk moves
  - Math Messaging Board
- Multiple models on the concrete, pictorial, and abstract levels
- Differentiation
  - Hint Cards
  - Think Beyond questions
- Creative problem solving/problem posing heuristic

(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:

<p>(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;</p> <p>(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;</p> <p>(C) compare and order whole numbers to 1,000,000,000 and represent comparisons using the symbols <math>&gt;</math>, <math>&lt;</math>, or <math>=</math>;</p> <p>(D) round whole numbers to a given place value through the hundred thousands place;</p> <p>(E) represent decimals, including tenths and hundredths, using concrete and visual models and money;</p> <p>(F) compare and order decimals using concrete and visual models to the hundredths;</p> <p>(G) relate decimals to fractions that name tenths and hundredths; and</p> <p>(H) determine the corresponding decimal to the tenths or hundredths place of a specified point on a number line.</p>	<p>(A) The Tenth Street Pet Sanctuary: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3</p> <p>(B) The Tenth Street Pet Sanctuary: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3</p> <p>(E) The Tenth Street Pet Sanctuary: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3</p> <p>(F) The Tenth Street Pet Sanctuary: Chapter 1, Lesson 2; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3</p> <p>(G) The Tenth Street Pet Sanctuary: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3</p> <p>(H) The Tenth Street Pet Sanctuary: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 2, Lesson 1; Chapter 2, Lesson 2</p>
<p>(3) Number and operations. The student applies mathematical process standards to represent and generate fractions to solve problems. The student is expected to:</p>	
<p>(A) represent a fraction <math>a/b</math> as a sum of fractions <math>1/b</math>, where <math>a</math> and <math>b</math> are whole numbers and <math>b &gt; 0</math>, including when <math>a &gt; b</math>;</p> <p>(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;</p>	<p>(A) Treasures from the Attic: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 1, Lesson 4</p> <p>(B) Treasures from the Attic: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 1, Lesson 4; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3</p>

<p>(C) determine if two given fractions are equivalent using a variety of methods;</p> <p>(D) compare two fractions with different numerators and different denominators and represent the comparison using the symbols <math>&gt;</math>, <math>=</math>, or <math>&lt;</math>;</p> <p>(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;</p> <p>(F) evaluate the reasonableness of sums and differences of fractions using benchmark fractions 0, <math>\frac{1}{4}</math>, <math>\frac{1}{2}</math>, <math>\frac{3}{4}</math>, and 1, referring to the same whole; and</p> <p>(G) represent fractions and decimals to the tenths or hundredths as distances from zero on a number line.</p>	<p>(C) Treasures from the Attic: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 1, Lesson 4; Chapter 2, Lesson 1; Chapter 2, Lesson 2</p> <p>(D) Treasures from the Attic: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 1, Lesson 4; Chapter 2, Lesson 1; Chapter 2, Lesson 2</p> <p>(E) Treasures from the Attic: Chapter 1, Lesson 1; Chapter 2, Lesson 1; Chapter 2, Lesson 2</p> <p>(F) Treasures from the Attic: Chapter 1, Lesson 1; Chapter 1, Lesson 3; Chapter 2, Lesson 1; Chapter 2, Lesson 2</p> <p>(G) Treasures from the Attic: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3</p>
<p>(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:</p>	
<p>(A) add and subtract whole numbers and decimals to the hundredths place using the standard algorithm;</p> <p>(B) determine products of a number and 10 or 100 using properties of operations and place value understandings;</p> <p>(C) represent the product of 2 two-digit numbers using arrays, area models, or equations, including perfect squares through 15 by 15;</p> <p>(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,</p>	<p>(A) The Tenth Street Pet Sanctuary: Chapter 1, Lesson 1; Chapter 1, Lesson 3; Chapter 2, Lesson 3</p> <p>(B) The Tenth Street Pet Sanctuary: Chapter 2, Lesson 1; Chapter 2, Lesson 3</p> <p>(C) The Tenth Street Pet Sanctuary: Chapter 2, Lesson 1; Chapter 2, Lesson 3</p> <p>(D) The Tenth Street Pet Sanctuary: Chapter 2, Lesson 1; Chapter 2, Lesson 3</p> <p>(E) The Tenth Street Pet Sanctuary: Chapter 2, Lesson 2; Chapter 2, Lesson 3</p>

<p>partial products, and the commutative, associative, and distributive properties;</p> <p>(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;</p> <p>(F) use strategies and algorithms, including the standard algorithm, to divide up to a four-digit dividend by a one-digit divisor;</p> <p>(G) round to the nearest 10, 100, or 1,000 or use compatible numbers to estimate solutions involving whole numbers; and</p> <p>(H) solve with fluency one- and two-step problems involving multiplication and division, including interpreting remainders.</p>	<p>(F) The Tenth Street Pet Sanctuary: Chapter 2, Lesson 2; Chapter 2, Lesson 3</p> <p>(H) The Tenth Street Pet Sanctuary: Chapter 2, Lesson 2; Chapter 2, Lesson 3</p> <p>(H) At the Mall with Algebra: Chapter 1, Lesson 1; Chapter 1, Lesson 4; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3; Chapter 2, Lesson 4</p>
<p>(5) Algebraic reasoning. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to:</p>	
<p>(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;</p> <p>(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;</p> <p>(C) use models to determine the formulas for the perimeter of a rectangle (<math>l + w + l + w</math> or <math>2l + 2w</math>), including the special form for perimeter of a square (<math>4s</math>) and the area of a rectangle (<math>l \times w</math>); and</p>	<p>(A) At the Mall with Algebra: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 1, Lesson 4; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3; Chapter 2, Lesson 4</p> <p>(B) At the Mall with Algebra: Chapter 1, Lesson 1; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3; Chapter 2, Lesson 4</p> <p>(C) The Tenth Street Pet Sanctuary: Chapter 2, Lesson 1; Chapter 2, Lesson 3</p> <p>(D) The Tenth Street Pet Sanctuary: Chapter 2, Lesson 1; Chapter 2, Lesson 3</p> <p>(D) Treasures from the Attic:</p>

<p>(D) solve problems related to perimeter and area of rectangles where dimensions are whole numbers.</p>	<p>Chapter 1, Lesson 4</p>
<p>(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:</p>	
<p>(A) identify points, lines, line segments, rays, angles, and perpendicular and parallel lines;</p> <p>(B) identify and draw one or more lines of symmetry, if they exist, for a two-dimensional figure;</p> <p>(C) apply knowledge of right angles to identify acute, right, and obtuse triangles; and</p> <p>(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.</p>	<p>(A) Getting into Shapes: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3</p> <p>(B) Getting into Shapes: Chapter 2, Lesson 1; Chapter 2, Lesson 2</p> <p>(C) Getting into Shapes: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 2, Lesson 1</p> <p>(D) Getting into Shapes: Chapter 1, Lesson 1; Chapter 1, Lesson 2</p>
<p>(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:</p>	
<p>(A) illustrate the measure of an angle as the part of a circle whose center is at the vertex of the angle that is "cut out" by the rays of the angle. Angle measures are limited to whole numbers;</p> <p>(B) illustrate degrees as the units used to measure an angle, where <math>\frac{1}{360}</math> of any circle is one degree and an angle that "cuts" <math>\frac{n}{360}</math> out of any circle whose center is at the angle's vertex has a measure of n degrees. Angle measures are limited to whole numbers;</p> <p>(C) determine the approximate measures of angles in degrees to the nearest whole number using a protractor;</p> <p>(D) draw an angle with a given measure; and</p>	<p>(A) Analyze This! Chapter 2, Lesson 2</p>

<p>(E) determine the measure of an unknown angle formed by two non-overlapping adjacent angles given one or both angle measures.</p>	
<p>(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:</p>	
<p>(A) identify relative sizes of measurement units within the customary and metric systems;</p> <p>(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</p> <p>(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.</p>	<p>(A) The Tenth Street Pet Sanctuary: Chapter 1, Lesson 2; Chapter 1, Lesson 3</p> <p>(A) Treasures from the Attic: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 1, Lesson 4; Chapter 2, Lesson 1; Chapter 2, Lesson 3</p> <p>(B) The Tenth Street Pet Sanctuary: Chapter 1, Lesson 2; Chapter 1, Lesson 3</p> <p>(B) Treasures from the Attic: Chapter 1, Lesson 2; Chapter 2, Lesson 1; Chapter 2, Lesson 3</p> <p>(C) The Tenth Street Pet Sanctuary: Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3</p> <p>(C) Treasures from the Attic: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 2, Lesson 1; Chapter 2, Lesson 3</p>
<p>(9) Data analysis. The student applies mathematical process standards to solve problems by collecting, organizing, displaying, and interpreting data. The student is expected to:</p>	
<p>(A) represent data on a frequency table, dot plot, or stem-and-leaf plot marked with whole numbers and fractions; and</p>	<p>(A) Analyze This! Chapter 1, Lesson 2; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3; Chapter 2, Lesson 4</p> <p>(B) The Tenth Street Pet Sanctuary: Chapter 1, Lesson 3</p>

(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.

(B) Analyze This!

Chapter 1, Lesson 2; Chapter 2, Lesson 1; Chapter 2, Lesson 2;  
Chapter 2, Lesson 3; Chapter 2, Lesson 4

## 111.7. Grade 5

(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.

Each lesson addresses these standards through the following:

- In-depth investigations and games
- Questioning strategies, including who, what, when, where, why and how questions
- Oral and written mathematical communication and argumentation
  - Think Deeply questions
  - Talk moves
  - Math Messaging Board
- Multiple models on the concrete, pictorial, and abstract levels
- Differentiation
  - Hint Cards
  - Think Beyond questions
- Creative problem solving/problem posing heuristic

(2) Number and operations. The student applies mathematical process standards to represent, compare, and order positive rational numbers and understand relationships as related to place value. The student is expected to:

- (A) represent the value of the digit in decimals through the thousandths using expanded notation and numerals;

(A) The Tenth Street Pet Sanctuary:  
Chapter 1, Lesson 1; Chapter 1, Lesson 2



<p>(B) compare and order two decimals to thousandths and represent comparisons using the symbols <math>&gt;</math>, <math>&lt;</math>, or <math>=</math>; and</p> <p>(C) round decimals to tenths or hundredths.</p>	<p>(B) The Tenth Street Pet Sanctuary: Chapter 1, Lesson 1; Chapter 1, Lesson 2</p> <p>(C) The Tenth Street Pet Sanctuary: Chapter 1, Lesson 2</p>
<p>(3) Number and operations. The student applies mathematical process standards to develop and use strategies and methods for positive rational number computations in order to solve problems with efficiency and accuracy. The student is expected to:</p>	
<p>(A) estimate to determine solutions to mathematical and real-world problems involving addition, subtraction, multiplication, or division;</p> <p>(B) multiply with fluency a three-digit number by a two-digit number using the standard algorithm;</p> <p>(C) solve with proficiency for quotients of up to a four-digit dividend by a two-digit divisor using strategies and the standard algorithm;</p> <p>(D) represent multiplication of decimals with products to the hundredths using objects and pictorial models, including area models;</p> <p>(E) solve for products of decimals to the hundredths, including situations involving money, using strategies based on place-value understandings, properties of operations, and the relationship to the multiplication of whole numbers;</p> <p>(F) represent quotients of decimals to the hundredths, up to four-digit dividends and two-digit whole number divisors, using objects and pictorial models, including area models;</p> <p>(G) solve for quotients of decimals to the hundredths, up to four-digit dividends and two-digit whole number</p>	<p>(A) The Tenth Street Pet Sanctuary: Chapter 1, Lesson 1; Chapter 1, Lesson 3; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3</p> <p>(A) Treasures from the Attic: Chapter 1, Lesson 1; Chapter 1, Lesson 4; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3</p> <p>(A) At the Mall with Algebra: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 1, Lesson 4; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3; Chapter 2, Lesson 4</p> <p>(C) The Tenth Street Pet Sanctuary: Chapter 2, Lesson 2</p> <p>(D) The Tenth Street Pet Sanctuary: Chapter 2, Lesson 1; Chapter 2, Lesson 3</p> <p>(E) The Tenth Street Pet Sanctuary: Chapter 2, Lesson 1; Chapter 2, Lesson 3</p> <p>(F) The Tenth Street Pet Sanctuary: Chapter 2, Lesson 2; Chapter 2, Lesson 3</p> <p>(G) The Tenth Street Pet Sanctuary: Chapter 2, Lesson 2; Chapter 2, Lesson 3</p> <p>(H) Treasures from the Attic: Chapter 1, Lesson 1; Chapter 2, Lesson 1; Chapter 2, Lesson 2</p>

<p>divisors, using strategies and algorithms, including the standard algorithm;</p> <p>(H) represent and solve addition and subtraction of fractions with unequal denominators referring to the same whole using objects and pictorial models and properties of operations;</p> <p>(I) represent and solve multiplication of a whole number and a fraction that refers to the same whole using objects and pictorial models, including area models;</p> <p>(J) represent division of a unit fraction by a whole number and the division of a whole number by a unit fraction such as <math>1/3 \div 7</math> and <math>7 \div 1/3</math> using objects and pictorial models, including area models;</p> <p>(K) add and subtract positive rational numbers fluently; and</p> <p>(L) divide whole numbers by unit fractions and unit fractions by whole numbers.</p>	<p>(I) Treasures from the Attic: Chapter 1, Lesson 4; Chapter 2, Lesson 3</p> <p>(J) Treasures from the Attic: Chapter 2, Lesson 3</p> <p>(K) Treasures from the Attic: Chapter 2, Lesson 1; Chapter 2, Lesson 2</p> <p>(L) Treasures from the Attic: Chapter 2, Lesson 3</p>
<p>(4) Algebraic reasoning. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to:</p>	
<p>(A) identify prime and composite numbers;</p> <p>(B) represent and solve multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity;</p> <p>(C) generate a numerical pattern when given a rule in the form <math>y = ax</math> or <math>y = x + a</math> and graph;</p>	<p>(B) At the Mall with Algebra: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 1, Lesson 4; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3; Chapter 2, Lesson 4</p> <p>(C) At the Mall with Algebra: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 2, Lesson 1; Chapter 2, Lesson 2</p> <p>(E) At the Mall with Algebra: Chapter 1, Lesson 1; Chapter 1, Lesson 4</p>

<p>(D) recognize the difference between additive and multiplicative numerical patterns given in a table or graph;</p> <p>(E) describe the meaning of parentheses and brackets in a numeric expression;</p> <p>(F) simplify numerical expressions that do not involve exponents, including up to two levels of grouping;</p> <p>(G) use concrete objects and pictorial models to develop the formulas for the volume of a rectangular prism, including the special form for a cube (<math>V = l \times w \times h</math>, <math>V = s \times s \times s</math>, and <math>V = Bh</math>); and</p> <p>(H) represent and solve problems related to perimeter and/or area and related to volume.</p>	
<p>(5) Geometry and measurement. The student applies mathematical process standards to classify two-dimensional figures by attributes and properties. The student is expected to classify two-dimensional figures in a hierarchy of sets and subsets using graphic organizers based on their attributes and properties.</p>	
	<p>Getting into Shapes: Chapter 1, Lesson 1; Chapter 1, Lesson 2</p> <p>Analyze This! Chapter 1, Lesson 1</p>
<p>(7) Geometry and measurement. The student applies mathematical process standards to select appropriate units, strategies, and tools to solve problems involving measurement. The student is expected to solve problems by calculating conversions within a measurement system, customary or metric.</p>	
	<p>The Tenth Street Pet Sanctuary: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3</p> <p>Treasures from the Attic: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 1, Lesson 4; Chapter 2, Lesson 1; Chapter 2, Lesson 3</p>

(8) Geometry and measurement. The student applies mathematical process standards to identify locations on a coordinate plane. The student is expected to:

(A) describe the key attributes of the coordinate plane, including perpendicular number lines (axes) where the intersection (origin) of the two lines coincides with zero on each number line and the given point (0, 0); the x-coordinate, the first number in an ordered pair, indicates movement parallel to the x-axis starting at the origin; and the y-coordinate, the second number, indicates movement parallel to the y-axis starting at the origin;

(B) describe the process for graphing ordered pairs of numbers in the first quadrant of the coordinate plane; and

(C) graph in the first quadrant of the coordinate plane ordered pairs of numbers arising from mathematical and real-world problems, including those generated by number patterns or found in an input-output table.

(A) Getting into Shapes:  
Chapter 2, Lesson 2; Chapter 2, Lesson 3

(A) Analyze This!  
Chapter 3, Lesson 1; Chapter 3, Lesson 2

(B) Getting into Shapes:  
Chapter 2, Lesson 2; Chapter 2, Lesson 3

(B) Analyze This!  
Chapter 3, Lesson 1; Chapter 3, Lesson 2

(C) Getting into Shapes:  
Chapter 2, Lesson 2; Chapter 2, Lesson 3

(C) Analyze This!  
Chapter 3, Lesson 1; Chapter 3, Lesson 2

(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 categorical data with bar graphs or frequency tables and numerical data, including data sets of measurements in fractions or decimals, with dot plots or stem-and-leaf plots;

(B) represent discrete paired data on a scatterplot; and

(C) solve one- and two-step problems using data from a frequency table, dot plot, bar graph, stem-and-leaf plot, or scatterplot.

(A) The Tenth Street Pet Sanctuary:  
Chapter 1, Lesson 3

(A) Analyze This!  
Chapter 1, Lesson 2; Chapter 2, Lesson 1; Chapter 2, Lesson 2;  
Chapter 2, Lesson 3; Chapter 2, Lesson 4

(B) Analyze This!  
Chapter 3, Lesson 1

(C) The Tenth Street Pet Sanctuary:  
Chapter 1, Lesson 3

(C) Analyze This!  
Chapter 1, Lesson 2; Chapter 2, Lesson 1; Chapter 2, Lesson 2;  
Chapter 2, Lesson 3; Chapter 2, Lesson 4

## 111.26. Grade 6

(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.

Each lesson addresses these standards through the following:

- In-depth investigations and games
- Questioning strategies, including who, what, when, where, why and how questions
- Oral and written mathematical communication and argumentation
  - Think Deeply questions
  - Talk moves
  - Math Messaging Board
- Multiple models on the concrete, pictorial, and abstract levels
- Differentiation
  - Hint Cards
  - Think Beyond questions
- Creative problem solving/problem posing heuristic

(2) Number and operations. The student applies mathematical process standards to represent and use rational numbers in a variety of forms. The student is expected to:

- (A) classify whole numbers, integers, and rational numbers using a visual representation such as a Venn diagram to describe relationships between sets of numbers;
- (B) identify a number, its opposite, and its absolute value;
- (C) locate, compare, and order integers and rational numbers using a number line;
- (D) order a set of rational numbers arising from mathematical and real-world contexts; and
- (E) extend representations for division to include fraction notation such as  $a/b$  represents the same number as  $a \div b$  where  $b \neq 0$ .

- (C) The Tenth Street Pet Sanctuary:  
Chapter 1, Lesson 1; Chapter 1, Lesson 2
- (D) The Tenth Street Pet Sanctuary:  
Chapter 1, Lesson 1; Chapter 1, Lesson 2
- (D) Treasures from the Attic:  
Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3;  
Chapter 1, Lesson 4; Chapter 2, Lesson 1
- (E) The Tenth Street Pet Sanctuary:  
Chapter 1, Lesson 1
- (E) Treasures from the Attic:  
Chapter 1, Lesson 1; Chapter 1, Lesson 4; Chapter 2, Lesson 3

(3) Number and operations. The student applies mathematical process standards to represent addition, subtraction, multiplication, and division while solving problems and justifying solutions. The student is expected to:

- (A) recognize that dividing by a rational number and multiplying by its reciprocal result in equivalent values;
- (B) determine, with and without computation, whether a quantity is increased or decreased when multiplied by a fraction, including values greater than or less than one;
- (C) represent integer operations with concrete models and connect the actions with the models to standardized algorithms;
- (D) add, subtract, multiply, and divide integers fluently; and

- (A) Treasures from the Attic:  
Chapter 2, Lesson 3
- (B) Treasures from the Attic:  
Chapter 1, Lesson 4; Chapter 2, Lesson 3
- (E) The Tenth Street Pet Sanctuary:  
Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3
- (E) Treasures from the Attic:  
Chapter 1, Lesson 4; Chapter 2, Lesson 3

(E) multiply and divide positive rational numbers fluently.

(4) Proportionality. The student applies mathematical process standards to develop an understanding of proportional relationships in problem situations. The student is expected to:

(A) compare two rules verbally, numerically, graphically, and symbolically in the form of  $y = ax$  or  $y = x + a$  in order to differentiate between additive and multiplicative relationships;

(B) apply qualitative and quantitative reasoning to solve prediction and comparison of real-world problems involving ratios and rates;

(C) give examples of ratios as multiplicative comparisons of two quantities describing the same attribute;

(D) give examples of rates as the comparison by division of two quantities having different attributes, including rates as quotients;

(E) represent ratios and percents with concrete models, fractions, and decimals;

(F) represent benchmark fractions and percents such as 1%, 10%, 25%,  $33\frac{1}{3}\%$ , and multiples of these values using 10 by 10 grids, strip diagrams, number lines, and numbers;

(G) generate equivalent forms of fractions, decimals, and percents using real-world problems, including problems that involve money; and

(H) convert units within a measurement system, including the use of proportions and unit rates.

(A) At the Mall with Algebra:  
Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3;  
Chapter 2, Lesson 4

(F) Treasures from the Attic:  
Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3;  
Chapter 1, Lesson 4

(G) The Tenth Street Pet Sanctuary:  
Chapter 1, Lesson 1; Chapter 2, Lesson 1; Chapter 2, Lesson 2;  
Chapter 2, Lesson 3

(G) Treasures from the Attic:  
Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3;  
Chapter 1, Lesson 4; Chapter 2, Lesson 1; Chapter 2, Lesson 2

(5) Proportionality. The student applies mathematical process standards to solve problems involving proportional relationships. The student is expected to:	
<p>(A) represent mathematical and real-world problems involving ratios and rates using scale factors, tables, graphs, and proportions;</p> <p>(B) solve real-world problems to find the whole given a part and the percent, to find the part given the whole and the percent, and to find the percent given the part and the whole, including the use of concrete and pictorial models; and</p> <p>(C) use equivalent fractions, decimals, and percents to show equal parts of the same whole.</p>	<p>(C) The Tenth Street Pet Sanctuary: Chapter 1, Lesson 1</p> <p>(C) Treasures from the Attic: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 1, Lesson 4; Chapter 2, Lesson 1</p>
(6) Expressions, equations, and relationships. The student applies mathematical process standards to use multiple representations to describe algebraic relationships. The student is expected to:	
<p>(A) identify independent and dependent quantities from tables and graphs;</p> <p>(B) write an equation that represents the relationship between independent and dependent quantities from a table; and</p> <p>(C) represent a given situation using verbal descriptions, tables, graphs, and equations in the form <math>y = kx</math> or <math>y = x + b</math>.</p>	<p>(B) At the Mall with Algebra: Chapter 1, Lesson 1; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 4</p> <p>(C) At the Mall with Algebra: Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 4</p>
(7) Expressions, equations, and relationships. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to:	
<p>(A) generate equivalent numerical expressions using order of operations, including whole number exponents and prime factorization;</p>	<p>(B) At the Mall with Algebra: Chapter 1, Lesson 1; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3; Chapter 2, Lesson 4</p> <p>(C) At the Mall with Algebra:</p>



<p>(B) distinguish between expressions and equations verbally, numerically, and algebraically;</p> <p>(C) determine if two expressions are equivalent using concrete models, pictorial models, and algebraic representations; and</p> <p>(D) generate equivalent expressions using the properties of operations: inverse, identity, commutative, associative, and distributive properties.</p>	<p>Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 1, Lesson 4; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3; Chapter 2, Lesson 4</p> <p>(D) At the Mall with Algebra: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 1, Lesson 4; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3; Chapter 2, Lesson 4</p>
--	---

(8) Expressions, equations, and relationships. The student applies mathematical process standards to use geometry to represent relationships and solve problems. The student is expected to:

<p>(A) extend previous knowledge of triangles and their properties to include the sum of angles of a triangle, the relationship between the lengths of sides and measures of angles in a triangle, and determining when three lengths form a triangle;</p> <p>(B) model area formulas for parallelograms, trapezoids, and triangles by decomposing and rearranging parts of these shapes;</p> <p>(C) write equations that represent problems related to the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers; and</p> <p>(D) determine solutions for problems involving the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers.</p>	<p>(B) The Tenth Street Pet Sanctuary: Chapter 2, Lesson 1; Chapter 2, Lesson 3</p> <p>(C) The Tenth Street Pet Sanctuary: Chapter 2, Lesson 1; Chapter 2, Lesson 3</p> <p>(C) Treasures from the Attic: Chapter 1, Lesson 4</p> <p>(D) The Tenth Street Pet Sanctuary: Chapter 2, Lesson 1; Chapter 2, Lesson 3</p> <p>(D) Treasures from the Attic: Chapter 1, Lesson 4</p>
---	---

(9) Expressions, equations, and relationships. The student applies mathematical process standards to use equations and inequalities to represent situations. The student is expected to:

<p>(A) write one-variable, one-step equations and inequalities to represent constraints or conditions within problems;</p> <p>(B) represent solutions for one-variable, one-step equations and inequalities on number lines; and</p> <p>(C) write corresponding real-world problems given one-variable, one-step equations or inequalities.</p>	<p>(A) At the Mall with Algebra: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 1, Lesson 4; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3; Chapter 2, Lesson 4</p> <p>(C) At the Mall with Algebra: Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3; Chapter 2, Lesson 4</p>
<p>(10) Expressions, equations, and relationships. The student applies mathematical process standards to use equations and inequalities to solve problems. The student is expected to:</p>	
<p>(A) model and solve one-variable, one-step equations and inequalities that represent problems, including geometric concepts; and</p> <p>(B) determine if the given value(s) make(s) one-variable, one-step equations or inequalities true.</p>	<p>(A) At the Mall with Algebra: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 1, Lesson 4; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3; Chapter 2, Lesson 4</p> <p>(B) At the Mall with Algebra: Chapter 1, Lesson 1; Chapter 1, Lesson 2; Chapter 1, Lesson 3; Chapter 1, Lesson 4; Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 2, Lesson 3; Chapter 2, Lesson 4</p>
<p>(11) Measurement and data. The student applies mathematical process standards to use coordinate geometry to identify locations on a plane. The student is expected to graph points in all four quadrants using ordered pairs of rational numbers.</p>	
	<p>Getting into Shapes: Chapter 2, Lesson 2; Chapter 2, Lesson 3</p> <p>Analyze This! Chapter 3, Lesson 1; Chapter 3, Lesson 2</p>
<p>(12) Measurement and data. The student applies mathematical process standards to use numerical or graphical representations to analyze problems. The student is expected to:</p>	

<p>(A) represent numeric data graphically, including dot plots, stem-and-leaf plots, histograms, and box plots;</p> <p>(B) use the graphical representation of numeric data to describe the center, spread, and shape of the data distribution;</p> <p>(C) summarize numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread), and use these summaries to describe the center, spread, and shape of the data distribution; and</p> <p>(D) summarize categorical data with numerical and graphical summaries, including the mode, the percent of values in each category (relative frequency table), and the percent bar graph, and use these summaries to describe the data distribution.</p>	<p>(A) The Tenth Street Pet Sanctuary: Chapter 1, Lesson 3</p>
<p>(13) Measurement and data. The student applies mathematical process standards to use numerical or graphical representations to solve problems. The student is expected to:</p>	
<p>(A) interpret numeric data summarized in dot plots, stem-and-leaf plots, histograms, and box plots; and</p> <p>(B) distinguish between situations that yield data with and without variability.</p>	<p>(A) The Tenth Street Pet Sanctuary: Chapter 1, Lesson 3</p>